

# Pawprints in Peril

● UIUX ● Product Design ● AR ● Service Design

PERSONAL PROJECT | STUDENT WORK | 4 MONTHS

Utilizes an interactive board game combined with an app to inspire children to understand, empathize and care for vulnerable animals through a multi-sensory learning experience. The process combines sound, vision, movement and AR scanning to bring the world of endangered wildlife to life.

As players take on different roles and navigate through different habitats, completing conservation tasks and uncovering the stories of endangered animals, the game encourages players not only to learn about the subject, but also to engage in respectful interactions with the animals, fostering empathy and a sense of responsibility to protect the natural world.



I was attracted by the animal adoption ads from Red Mountain Zoo in Nanjing.

List of Adoptable Animals

I often go to the zoo to see her and learned that she is one of the vulnerable animals.

her favorite foods

Inspiration

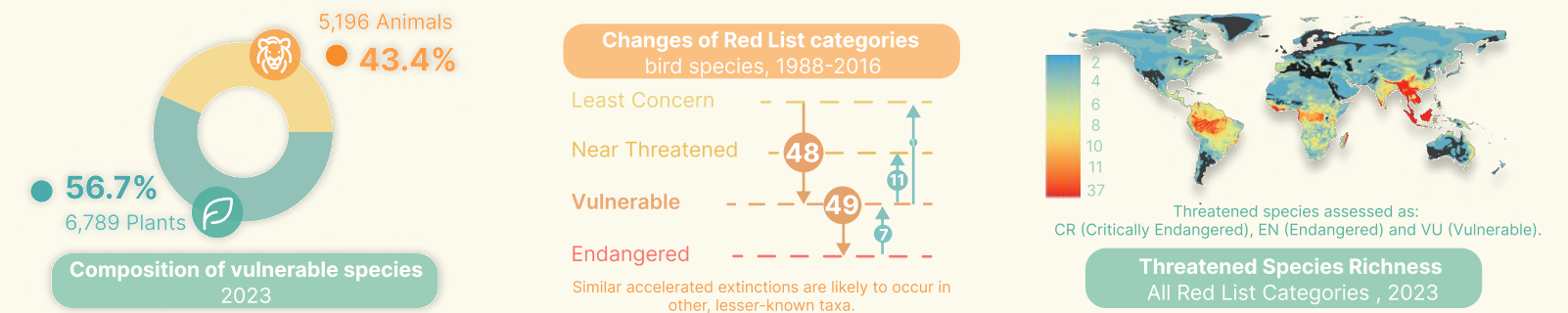
The otter I adopted is called Banna, a six-year-old Asia small-clawed otter.

## Research Questions

- What are vulnerable animals?
- Why are vulnerable animals often overlooked by people?
- Where do people's discrimination or favoritism towards animals come from?
- How can we expand public awareness of vulnerable animals?
- How should people properly live in harmony with wildlife?

## Introduction of Vulnerable animals

**Definition**  
Vulnerable (VU) species are species considered to be facing a high risk of extinction in the wild. They are threatened with extinction unless the circumstances that are threatening its survival and reproduction improve.



### Criteria for Identification of Vulnerable Animals

- Population Decline:** A continuing population decline of 20% or more in five years or two generations. **20%**
- Extinction Risk:** A 20% or higher chance of becoming extinct in the next 20 years or five generations. **20 Years**
- Extent of Occurrence (EOO):** An extent of occurrence (EOO) of less than 5,000 square kilometers. **5000 sq.km**
- Population Size:** 250 or fewer mature individuals per sub population. **250**

### Causes of marginalization

- Imbalance in conservation:** Public are more concerned about endangered species. Disproportionate focus on pets or large, charismatic, and visually appealing species.
- Insufficient data:** Lack of data collection, reporting and analysis makes it difficult to plan programs and to evaluate their effectiveness.
- Low public awareness:** There are 1,459 animals on the U.S. Endangered Species List, but Americans believe there are only 100.

### Significance of Conservation

- Economic Value:** Humans enjoy observing rare animals. The shark diving industry alone brings in **\$42.2 million** per year in Fiji.
- Cultural Extinction:** The global diving industry is worth more than **\$4 billion**.
- Example:** e.g Clouded Leopard (Neofelis nebulosa)

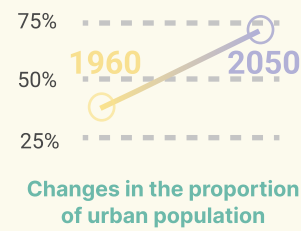
**U And Humans**

- People's preferences
- Under-prioritization
- People's ignorance of wildlife conditions
- Protect the ecological chain
- By conserving wildlife, we're ensuring that future generations can enjoy our natural world.
- Impact on Human Biosphere Health**

# Difficulties in the Current Protection of VU

## Background: Animals and Cities

More and more people are now living in cities. By 2050, about 70% of the world's total population will live in cities.

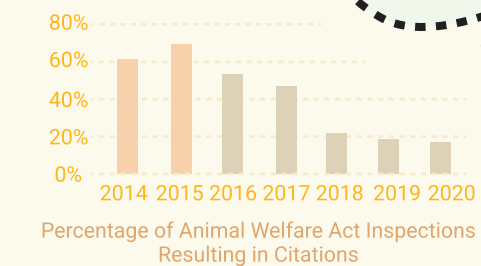
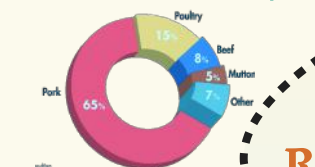


Habitats that wildlife has used for millions of years are rapidly falling into the hands of city dwellers.

## Traditional Views of Animals

- Binary Thinking
- Give people a sense of permission to be indifferent about the rights and freedoms of animals.

## Chinese Meat Consumption



## Inadequate Laws



## Reliance on Researchers

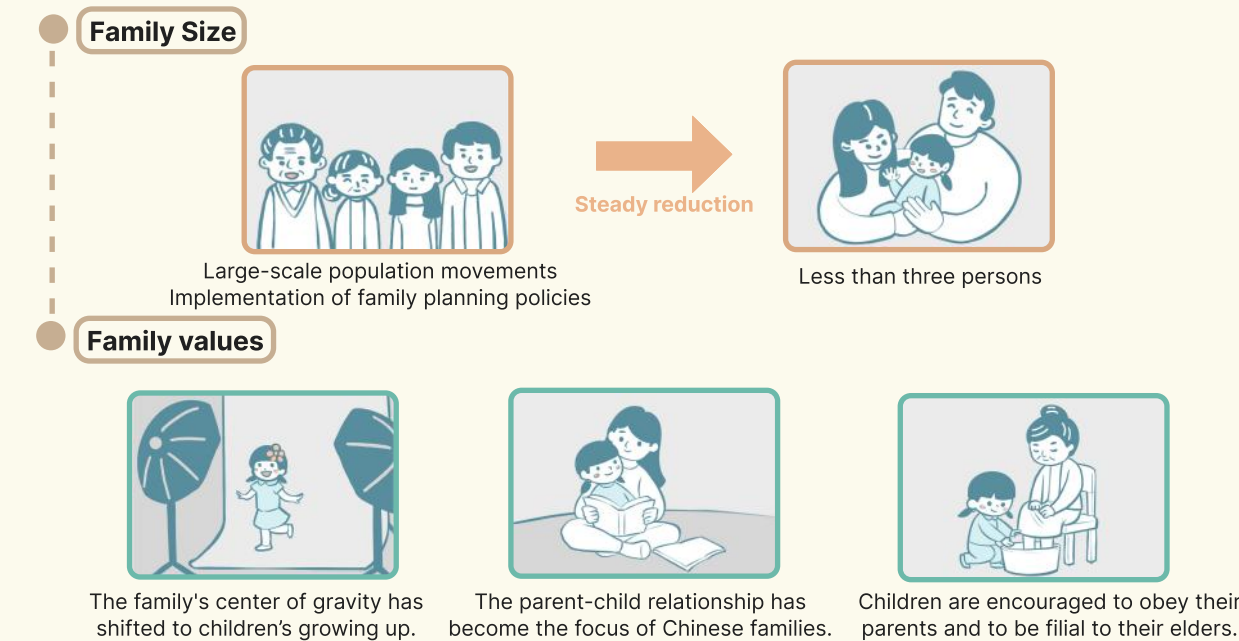
- High degree of specialization
- Insufficient information dissemination
- Ideology gap

Ordinary people feel unable to participate in conservation projects that require specialized knowledge.

## Lack of Public Participation

# Cultural and Social Background of VU Protection

## Chinese Family Structure



## Influence

- Parental attitudes and behaviors
- Traditional views in the family

- Time and energy constraints.

## Limitations

- Limited Range  
• Themes focus mainly on animals commonly encountered

- Lack Depth  
• Content focus primarily on emotional and moral education

- Lack of Specialities  
• Different regions have distinct animal species

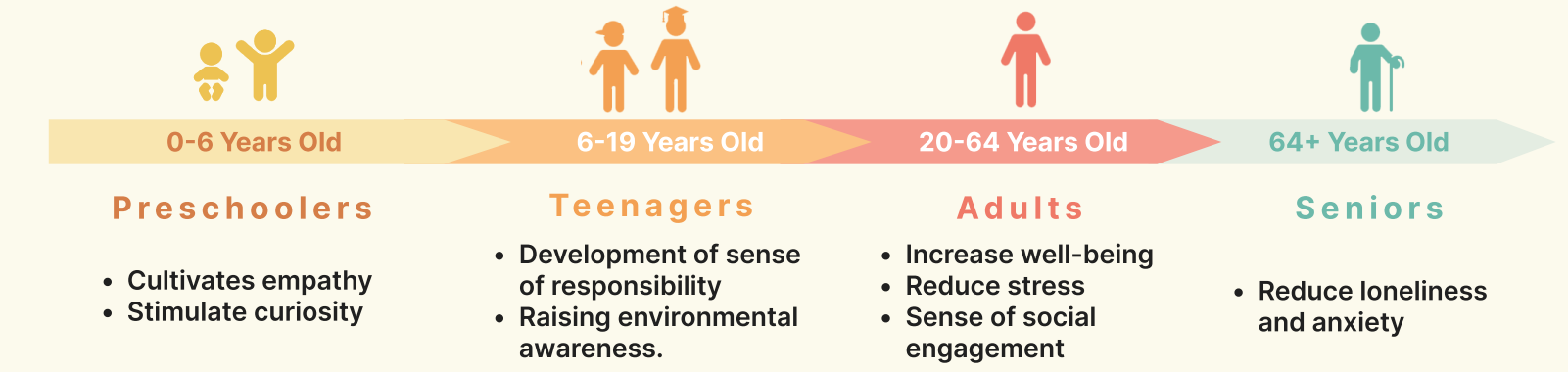
- Insufficient Interactivity  
• Over-reliance on text and images

## Approaches to Animal Protection Education in Society

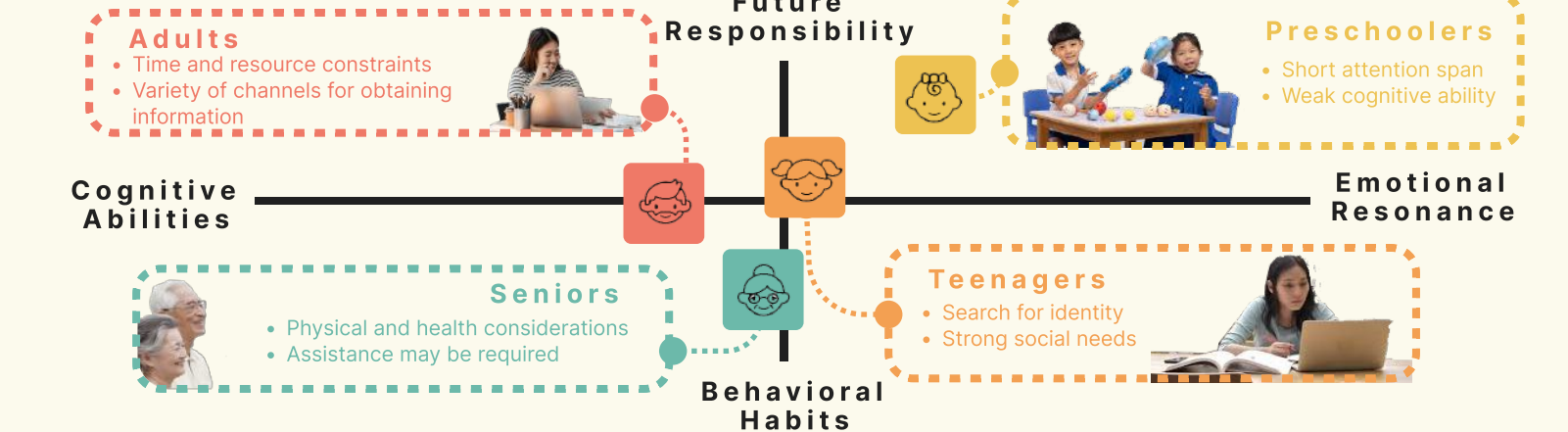


# Benefits of VU Protection

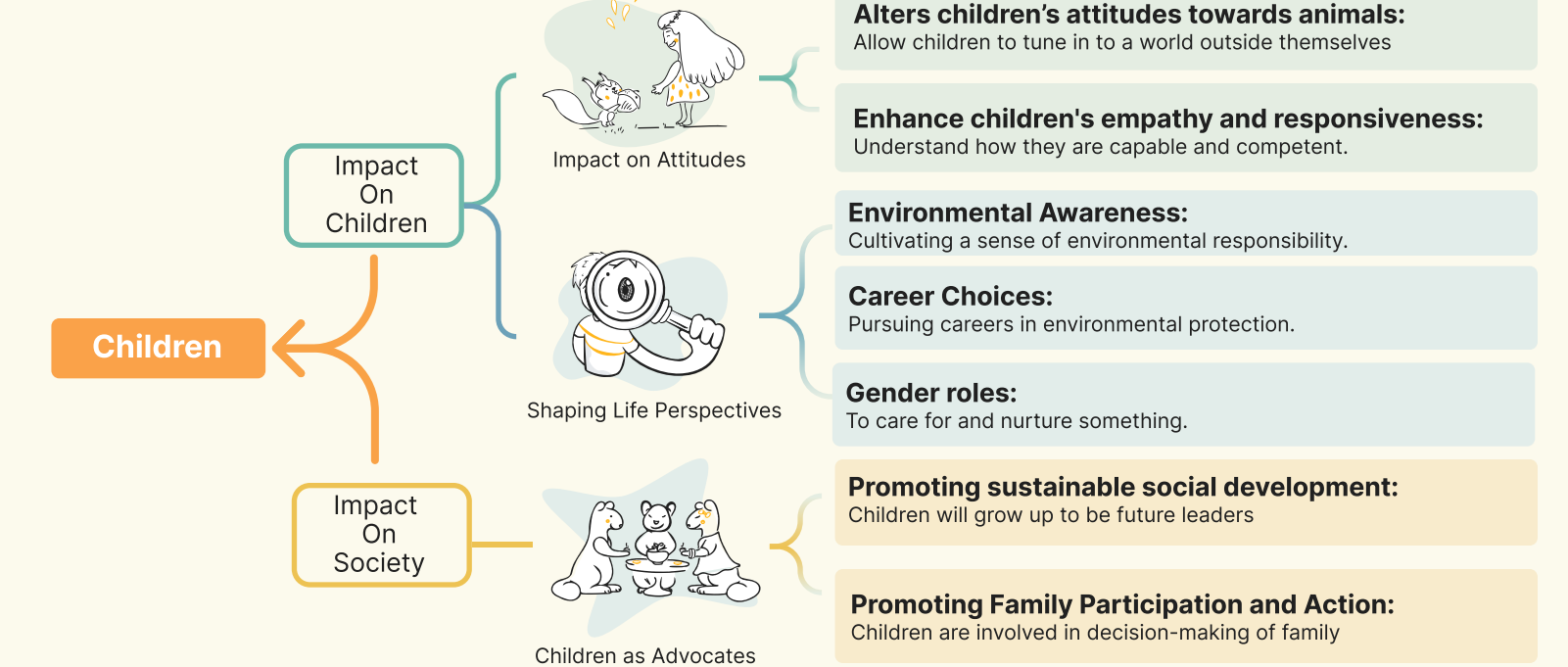
## Benefits on Different Age Groups



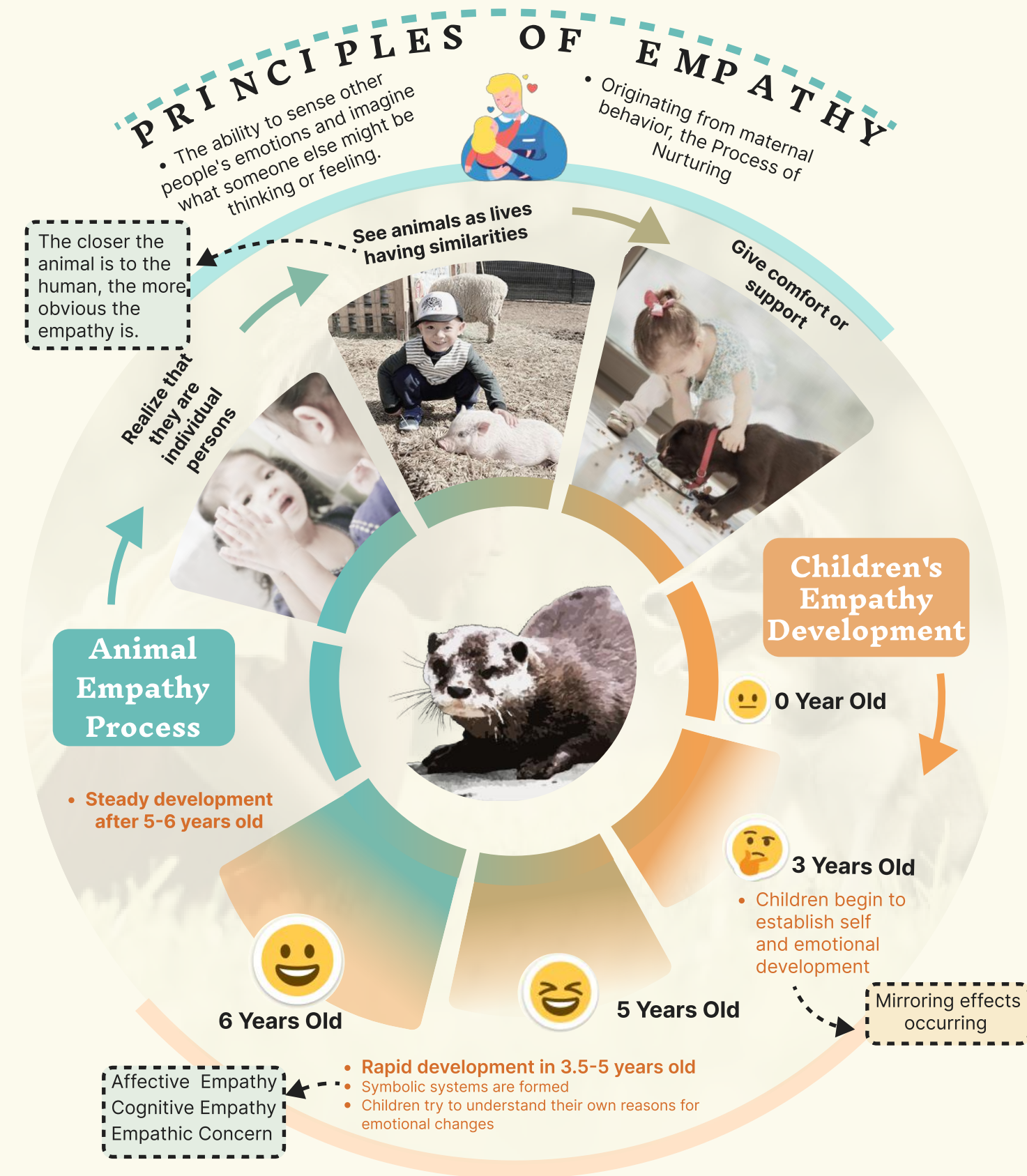
## Characteristics of Age Groups



## Selection of Target Group



# Theoretical studies



# Interview

- I interviewed parents from four different families.
- They are the parents and grandparents of their children.

*'I hope my child can experience it first hand.'*

*'My son and I would look for information about animals on the internet, but it was usually too professional.'*

**Mr. Yan**  
Father of a 2nd grader

*'I bought some picture books for my daughter but the content is repetitive.'*

*'Current animal picture books are too geared towards preschoolers, with too many childish themes.'*

**Mrs. Du**  
Mother of a three-year-old.

### Pain Points

- Older people have negative attitudes towards animals due to experiences such as famine.
- Insufficient knowledge base about animals and lack of access to information
- Prejudice against specific wild species

*'Bad animals should be eliminated.'*

*'Animals like pests and mice should still be eliminated, affecting the grain harvest and people's life.'*

**Mrs. Zhang**  
Grandma of a ten-year-old.

*'Dangerous animals should not be touched, safety first.'*

*'There are wild boars and mosquitoes in Zijing Mountain, and kids should not get close to them.'*

**Mr. Li**  
Grandpa of a five-year-old

# Observation

- I visited Nanjing Xianlin Foreign Language Primary School for observation.
- In the first outdoor lesson the teacher led the students to the Zhongshan Mausoleum Natural Scenic Area.

I joined two second grade natural science courses.

During the outdoor practice, the children found a small bird that seemed to be injured.

The children first provided it with simple water and cookie crumbs.

Afterwards, the children also used cardboard boxes to build a temporary shelter for the bird and contacted the Nanjing Wildlife Protection Organization to come and take the bird away.

The children wrapped the bird in a small bucket and paper towels and brought it to school.

### Problems I found

- Children touch the chicks directly with their hands.
- Children feed the animals with cookies.
- Children were more interested in the rescued birds than in the other birds that the teacher taught them about.
- There was more participation in the craft activities than in the classroom.

Afterwards, the school conducted some popularization lessons related to wild birds:

The teachers prepared information and pictures related to the biological structure of birds to popularize the knowledge.

The children made transparent anti-bird collision flags.

# Persona & Participants



**Name:**  
Yanxiu Sun  
**Age:**  
9-year-old  
**Gender:**  
Female

**Pain Points:**  
Yanxiu loves animals, but her only exposure is when her mom takes her to the zoo and the aquarium. She wants to learn more about different animals and experience them.

**Experience:**  
Yanxiu is a second-grader living in Nanjing, and I observed her attending a bird-watching event with her mother during Bird-Friendly Week, organized by the Red Mountain Zoo in Nanjing.

**Yanxiu's Mother**



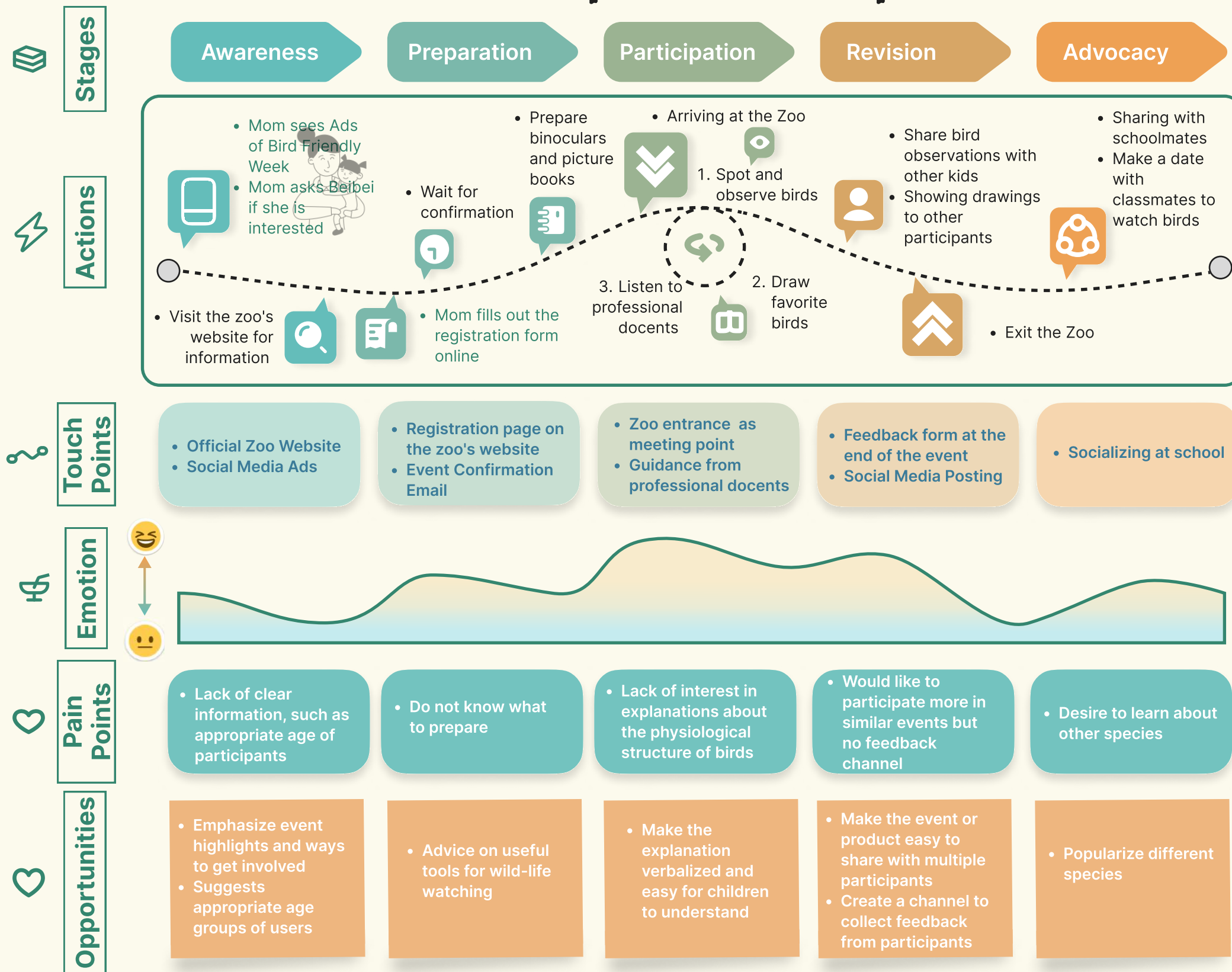
**Requirement:**  
Yanxiu's mom, who is only free to spend time with Yanxiu on Sundays, wanted a product or activities that would allow Yanxiu to play and learn alone.

**Yanxiu's Grandma**

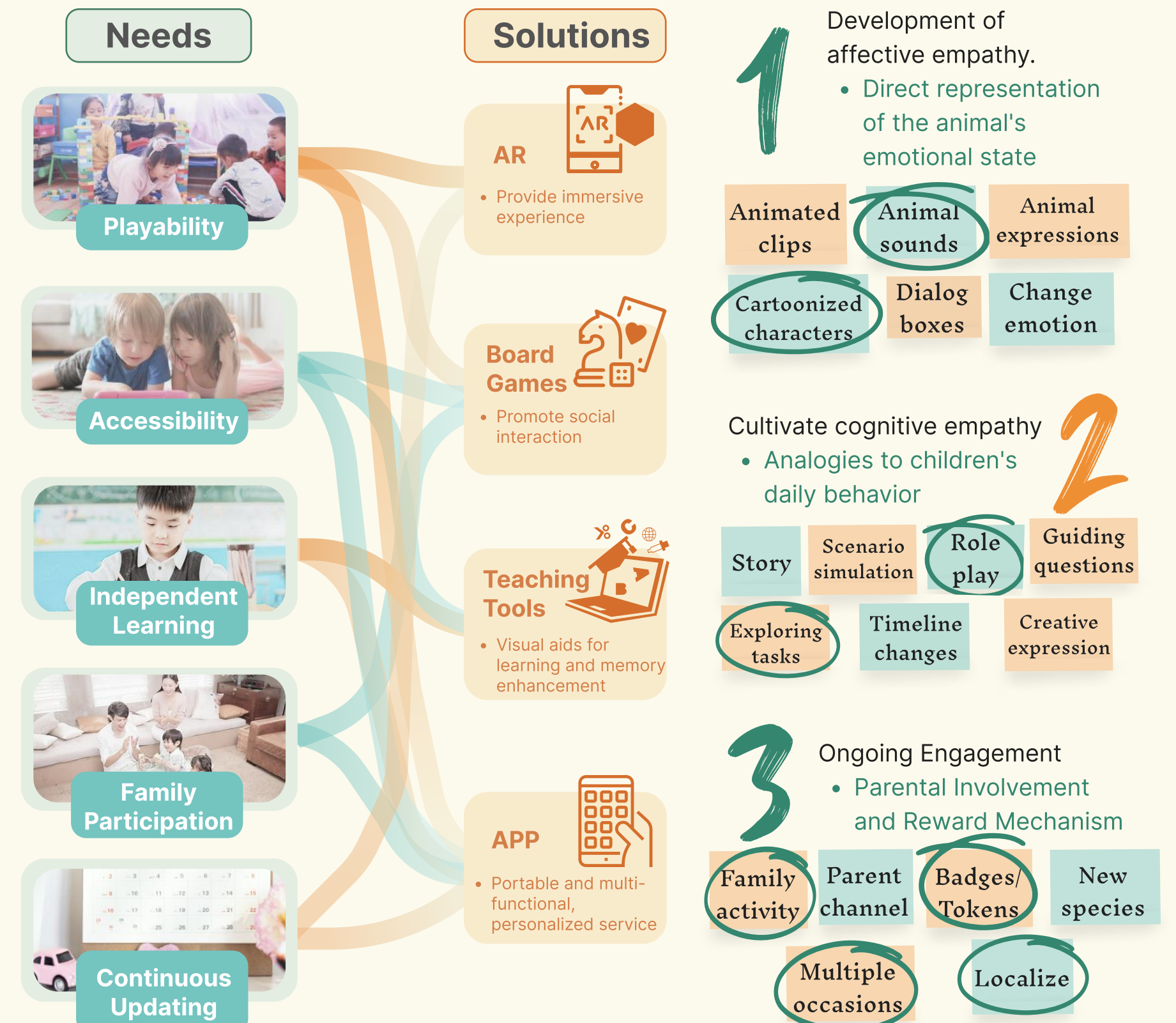
**Requirement:**  
Yanxiu's grandmother is often unable to answer Yanxiu's questions about animals due to the limitations of her low education.



# User Experience Map

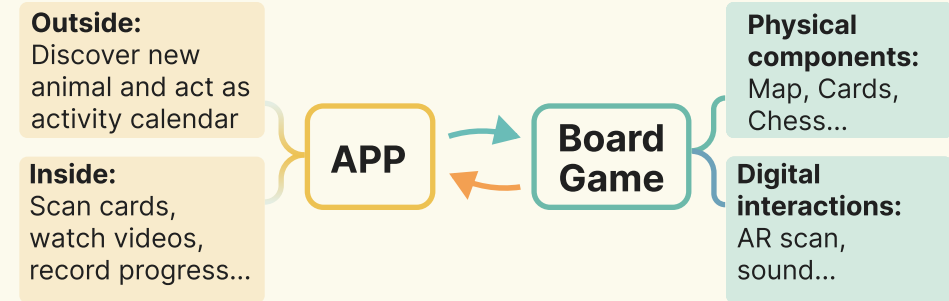


# Brain Storming & Design Opportunities



# Scheme Design

## Outline

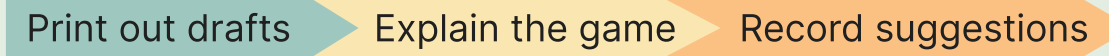


## Moodboard and Sketches



# Prototype Testing

- I created drafts of the cards and board and invited target users to test them.
- With this test I want to make sure that the game flow is playable and flowing and seek suggestions from users



## 1 First Test



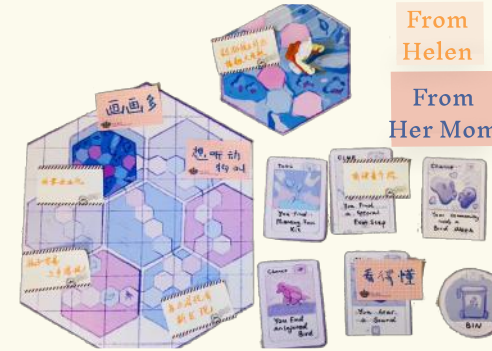
**Action** I invited Helen Pan, a seven-year-old girl and her mother to experience the prototype.

### Problems

- Because the draft was text-based, Helen needed a lot of guidance while playing and lacked a game experience.

### Suggestions

- Picture-based
- Multi-sensory experience
- Encourage kids to go out
- Easy to understand steps



## 2 Second Test



**Action** I invited Yan Wang, a 6th grader, to experience a simple game from spotting clues to solving problems.

### Suggestions

- Players can make their own choices about where to go on the map and what to do during encounters
- Different choices lead to different endings
- Increase rewards such as medals and collectible achievements

Join the rural scene

Life-related events like white pollution



## 3 Improvements

- Literacy level of the target group
- Interest in images

The cards will remove the textual introduction and focus on drawings



Add NFC sticker

- Lack of patience
- Difficulty concentrating

Adding sounds and animations with nfc

- Allow players to change the map themselves

Use puzzle style map

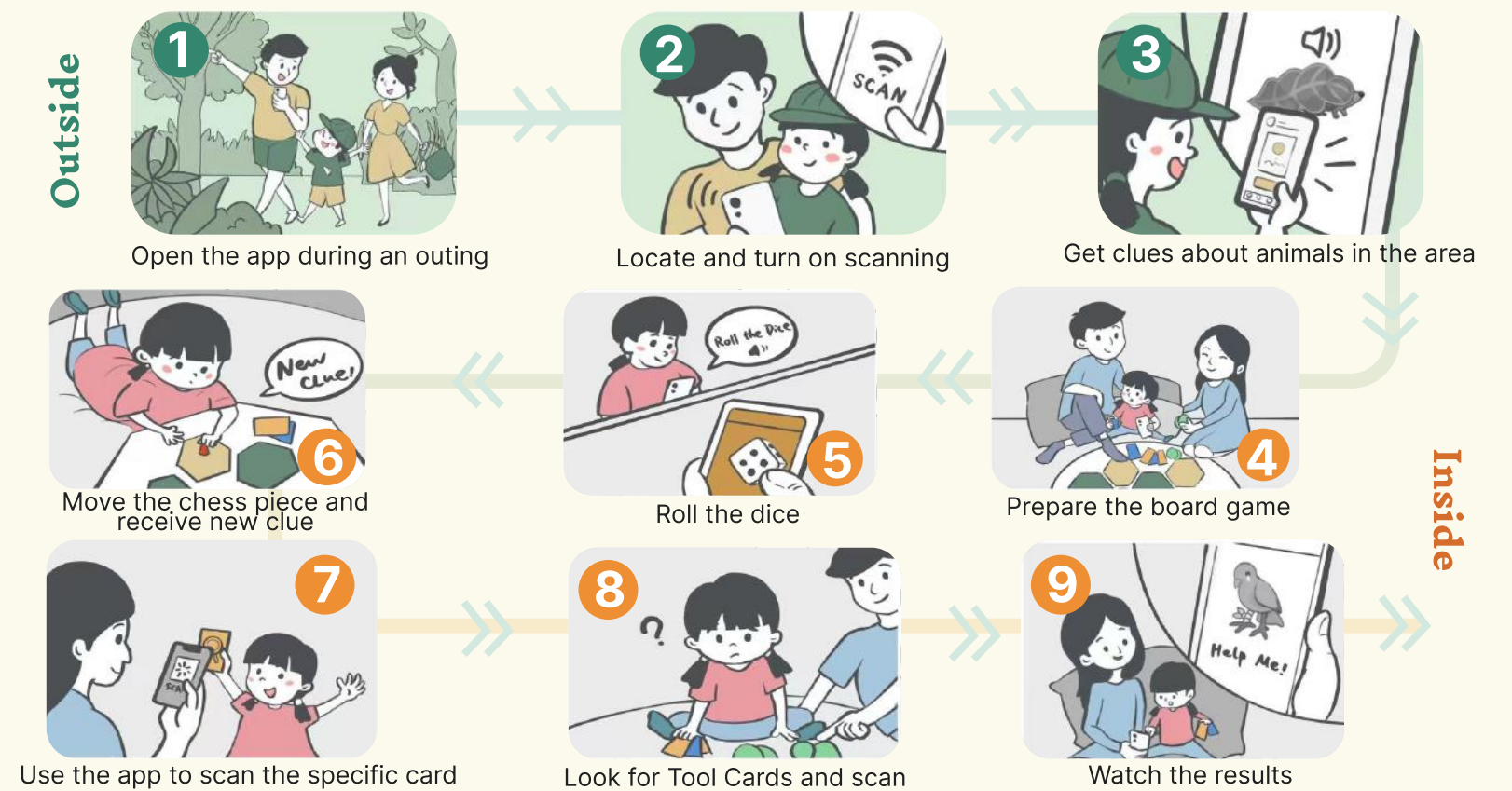
- More rewards

Players can participate in volunteer activities when they level up

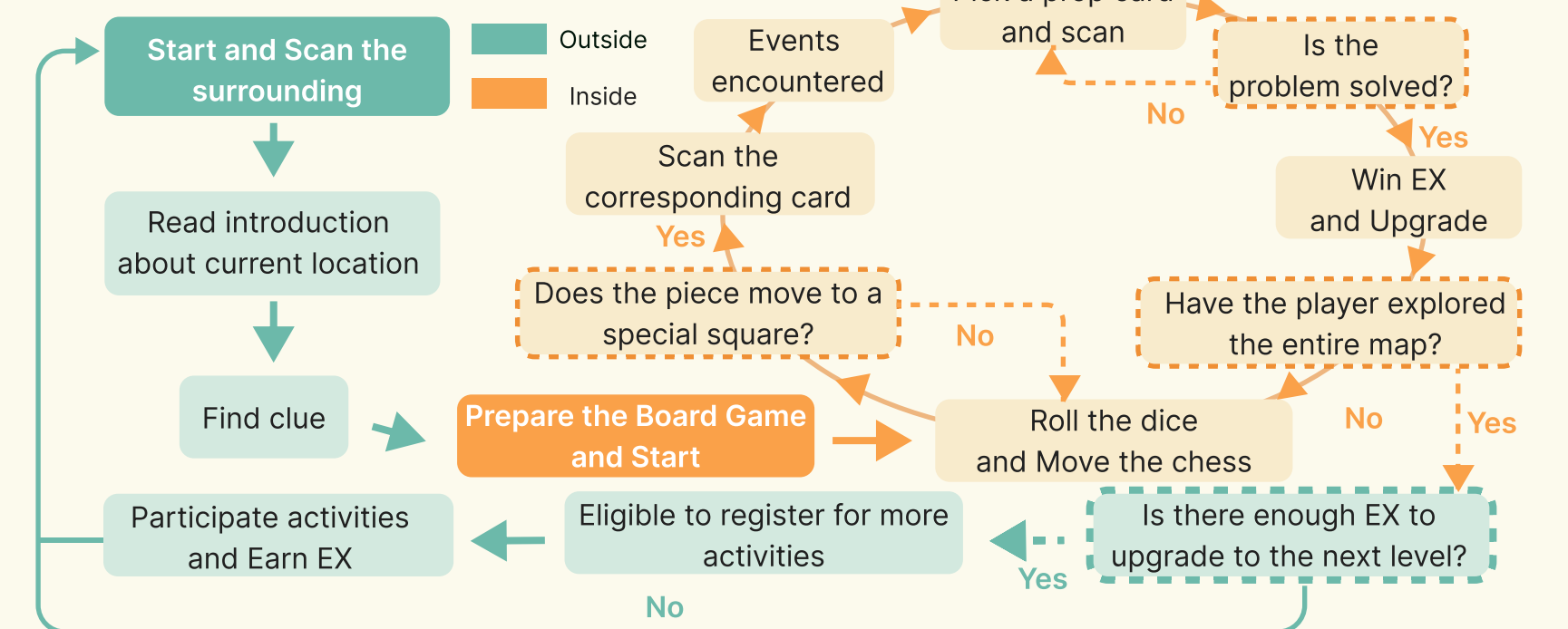
- App and board game interaction

Dice casting and scanning on the phone

# Storyboards



# Game Flow



# User Co-creation

- I invited 6 children to participate in the initial design process by cognitive drawing.
- The goal is to make the entire product more aesthetically pleasing to the target group.

First, the children were invited to draw their favorite animal.



Cat, rabbit and so on  
**Furry Animals: 4**

Gold fish and Turtle  
**Others: 2**

Secondly, I asked the kids to draw what they commonly saw in nature.



Similarities:  
• Vibrant colors  
• Forest  
• Geometric shapes



## Conclusion



- Use hand-painted style
- The guiding character will be the water deer
- Draw animal with expression
- Prefer warm color scheme
- Orange as the major color

# Board Game Components Specification



## Clue Card

- Provide basic information about a collected vulnerable animals
- Through photos, videos and audio
- Enhance players' intuitive understanding and curiosity.

## Event Card

- Describe a variety of events related to animals and environmental conservation
- Allow players to learn about current situation and make decision



## Tool Card

- Provides a variety of tools to help players protect animals or tackle challenges
- Increase the interactivity and fun of the game

## Map Design

### Localization

- Add Nanjing's landmark attractions and 6 main types of terrain to the map
- Players can trigger events or quests when they arrive at or pass by specific location

### Stylization

- Crayon and children's hand-drawing style
- Quickly attract children's attention



## Chess Piece Design

<p>wildly common</p> <p>Discoverer</p>	<p>lively and cute</p> <p>Observer</p>	<p>symbolism</p> <p>Protector</p>
①	②	③
Discoverer Eight-colored Thrush	Observer Asian Small-clawed Otter	Protector Giant Panda
<ul style="list-style-type: none"> <li>• Symbolize process of exploring</li> </ul>	<ul style="list-style-type: none"> <li>• In-depth observation and recording.</li> </ul>	<ul style="list-style-type: none"> <li>• Action to protect</li> </ul>

# Manufacturing Process

**Cards with nfc sensing**

**7 hexagonal grid maps**

Front and back sides with nfc sensor tag affixed to the inner side

Cut and Stick

**Decorative mini models**

Houses, trees and stones

**Turf**

**Wooden board**

**Wooden board with edges**

**Controller**

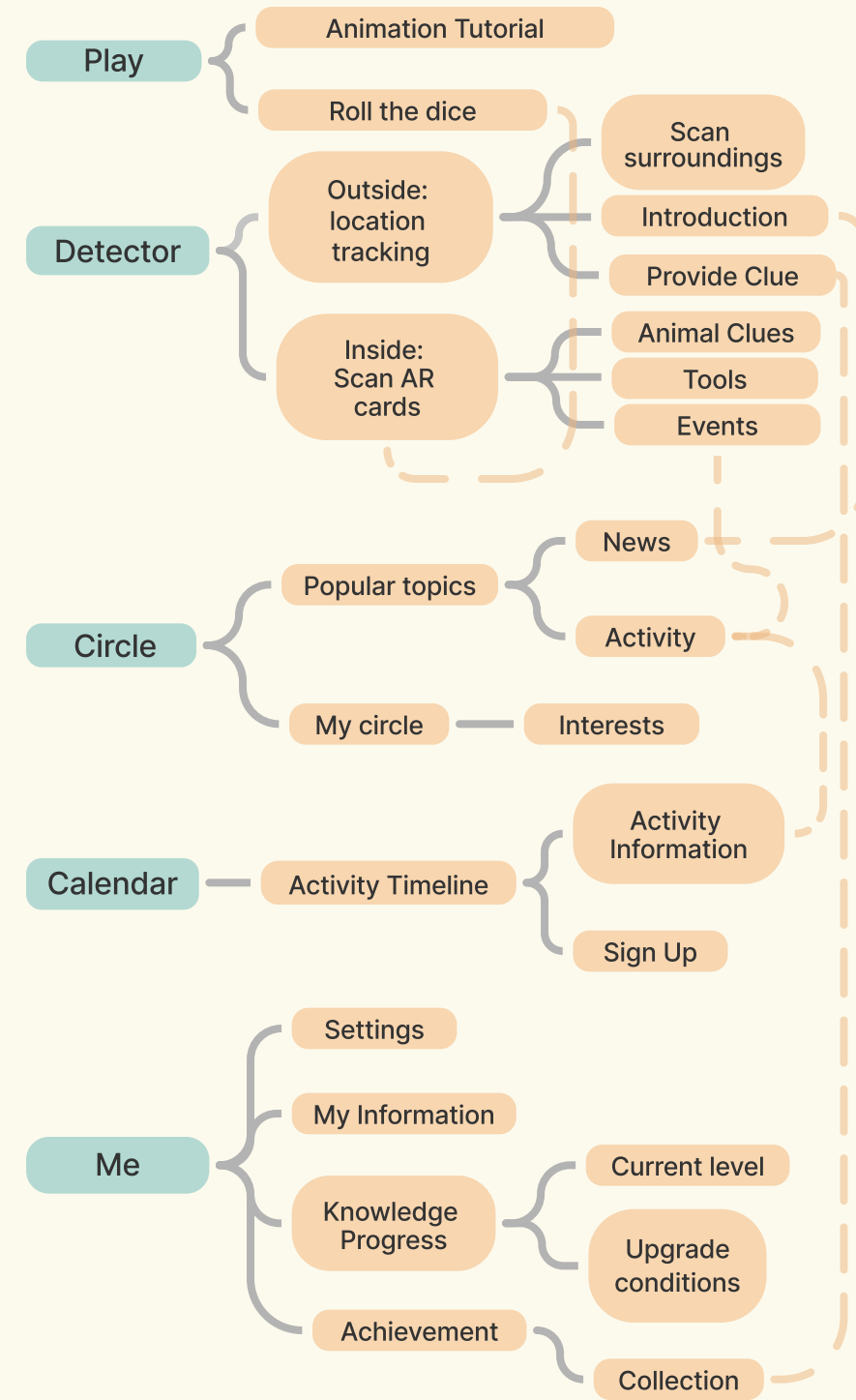
**Reader**

**Base board**

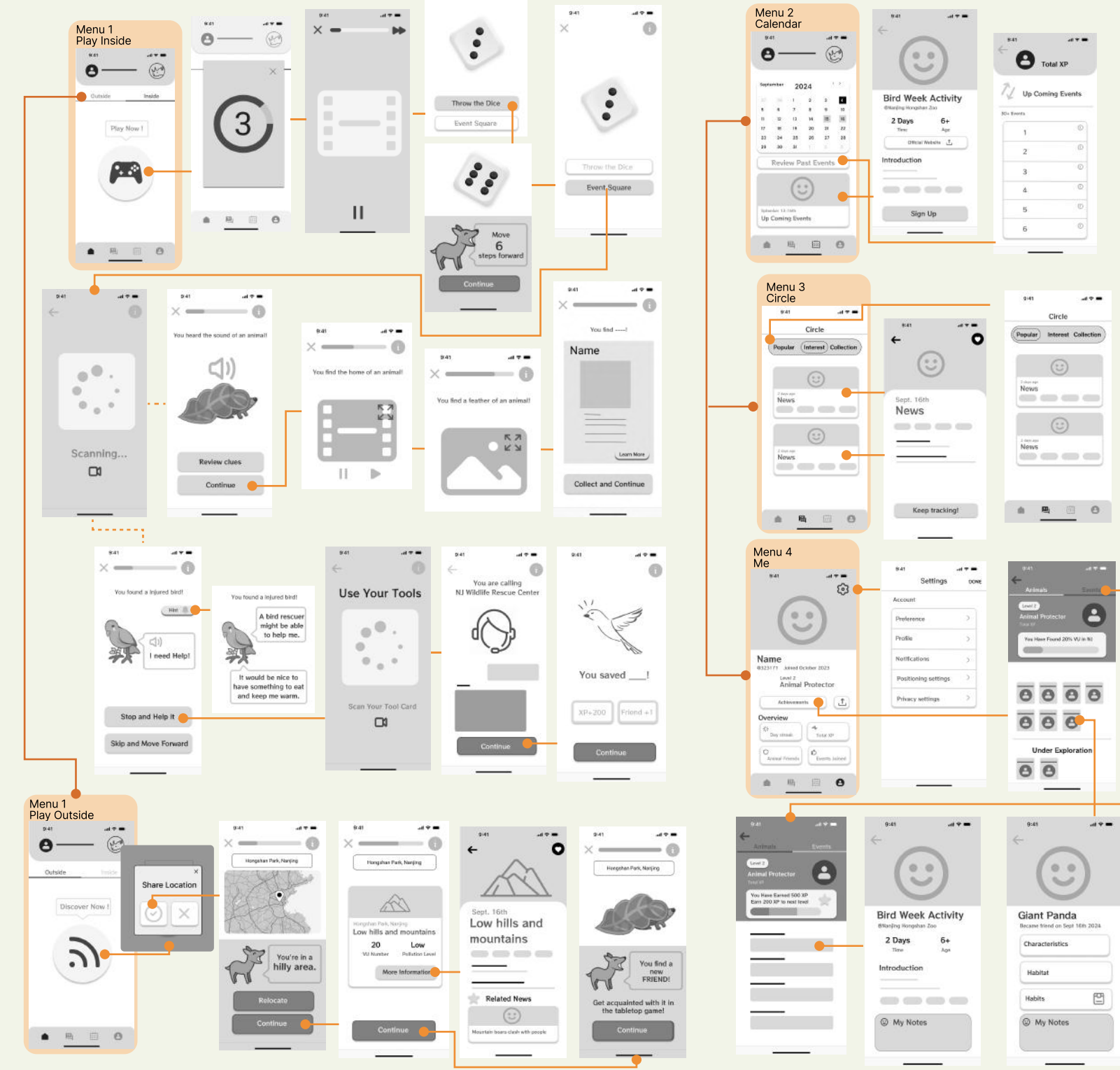
Circuit connection

# App Design

## Site Map



## Low-Fidelity



## UI Specification

- **Color**
  - #FCCEB4
  - #F98C53
  - #212121
  - #D2E0AA
  - #ABD7FB
- **Fonts**
  - Rowdies 24px**
  - NUNITO 24PX**
  - Rowdies 16px**
  - RocknRoll One 14px**
- **Icons**
- **IP and Logo Design**
  - Water deer
  - PIP

## AR Avatar Design

- **Guide Characters**

Guide characters assist players during AR exploration and provide immersive, responsive feedback throughout gameplay.

  - **Character Consistency**
    - Uses the same three character roles as the board game pieces
  - **Role Progression**
    - Roles unlock as the game progresses, guiding players through each stage
- **Stylized 3D Style**
  - Characters are modeled in a friendly, cartoonish 3D style
- **Expressive Reactions**
  - Characters display unique expressions in response to in-game events

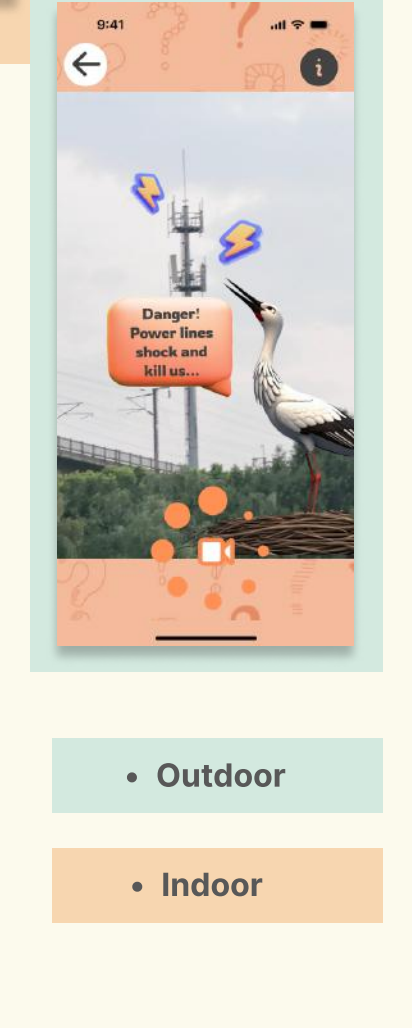
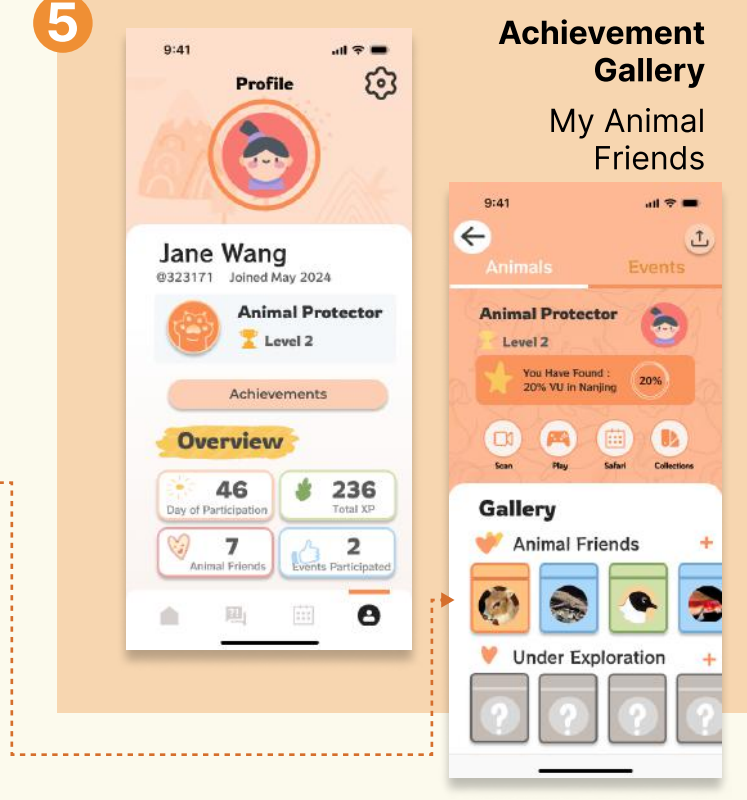
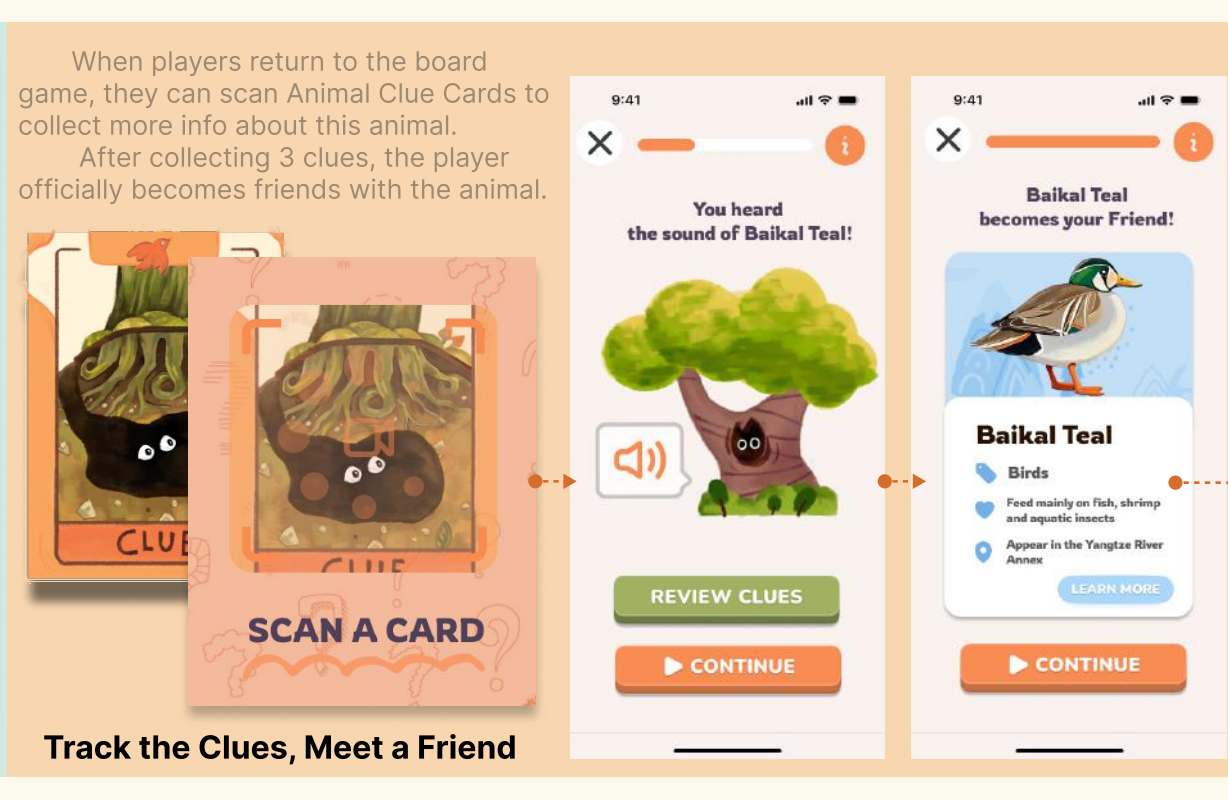
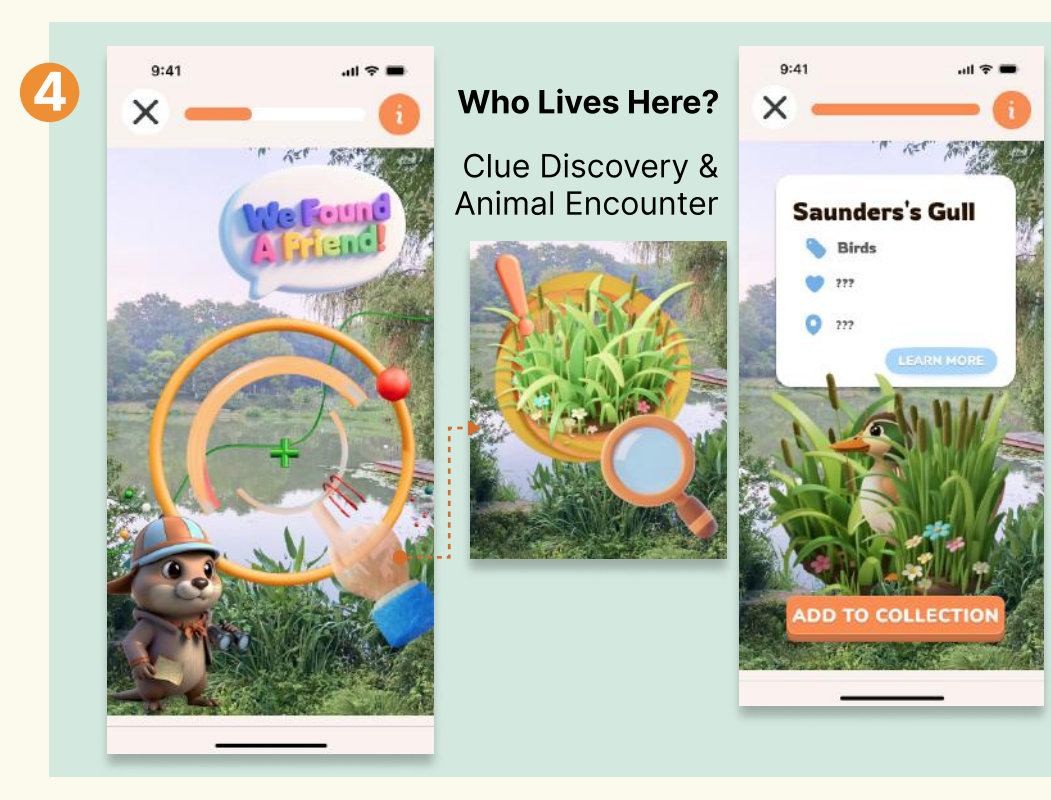
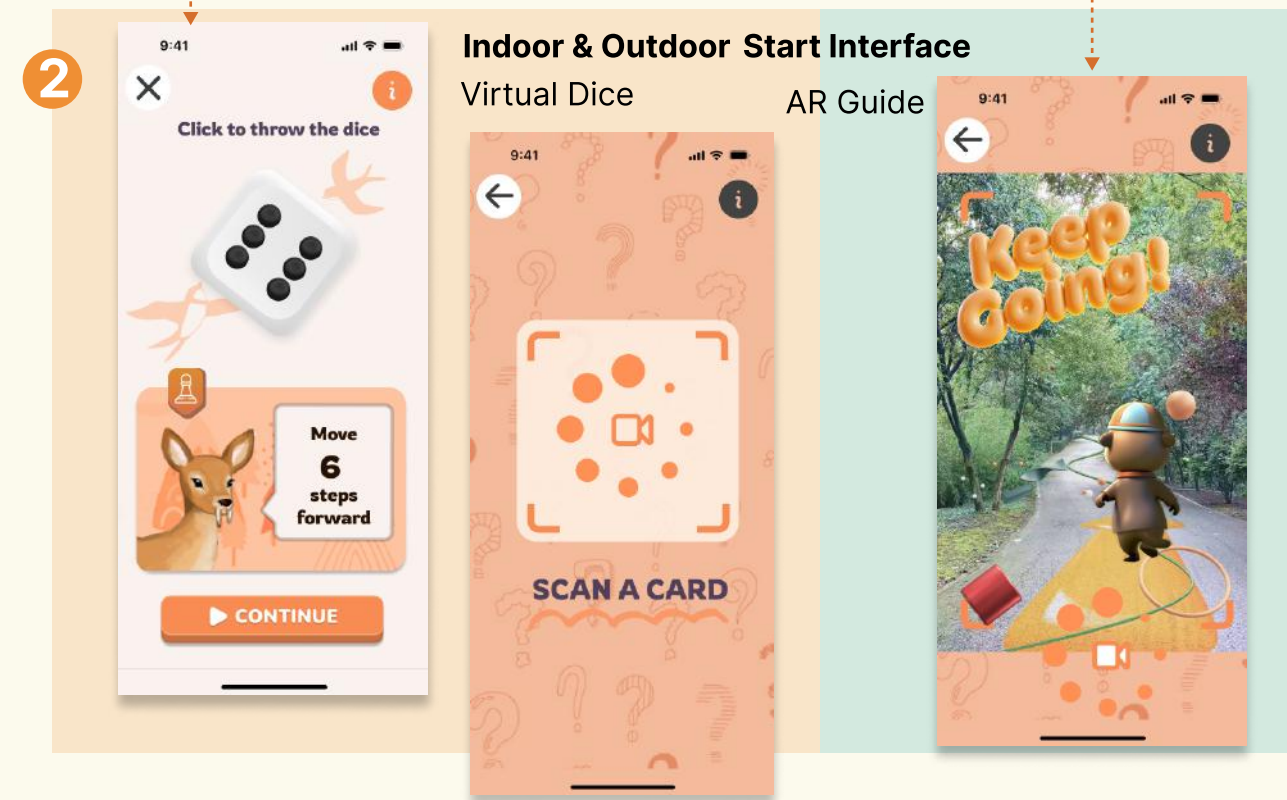
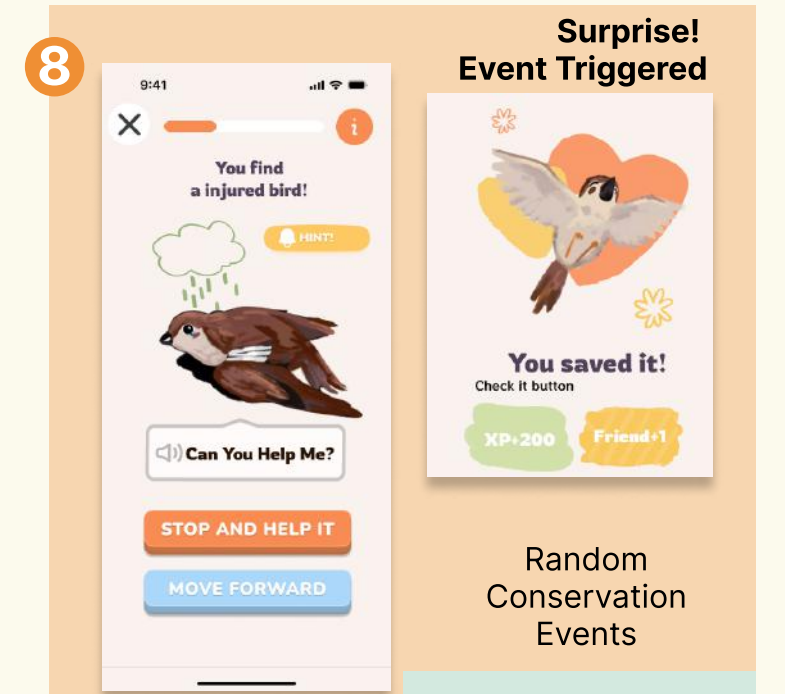
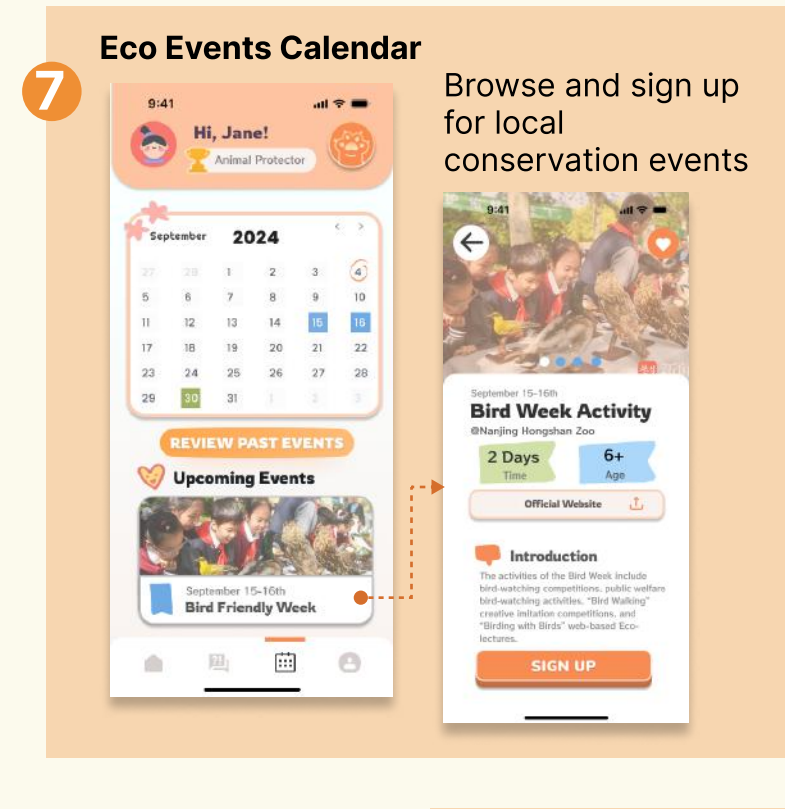
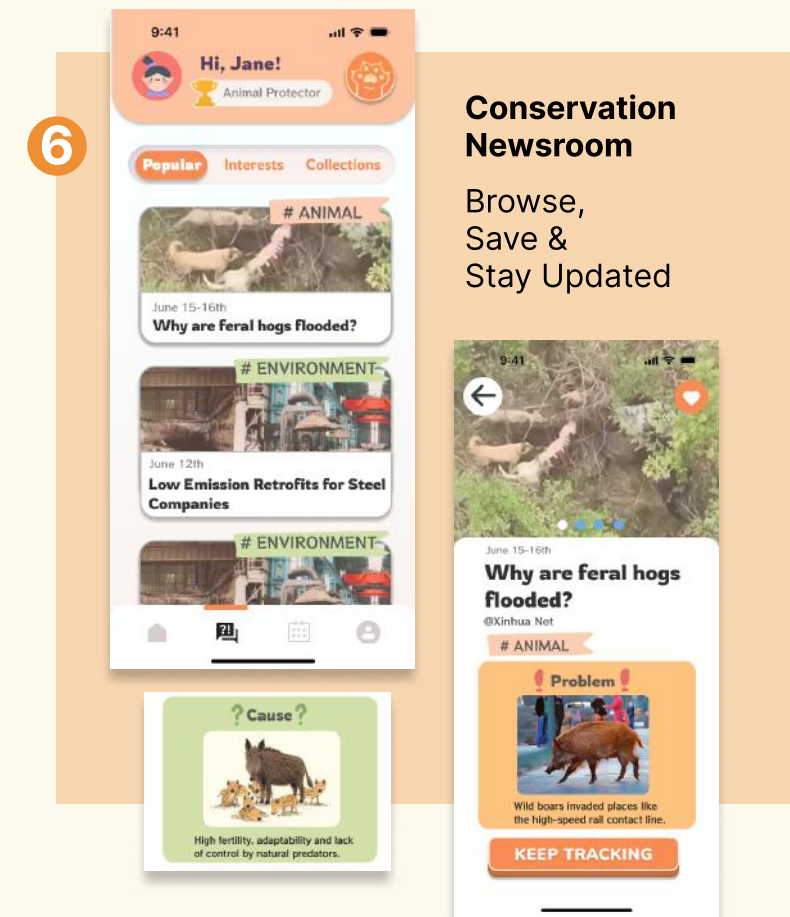
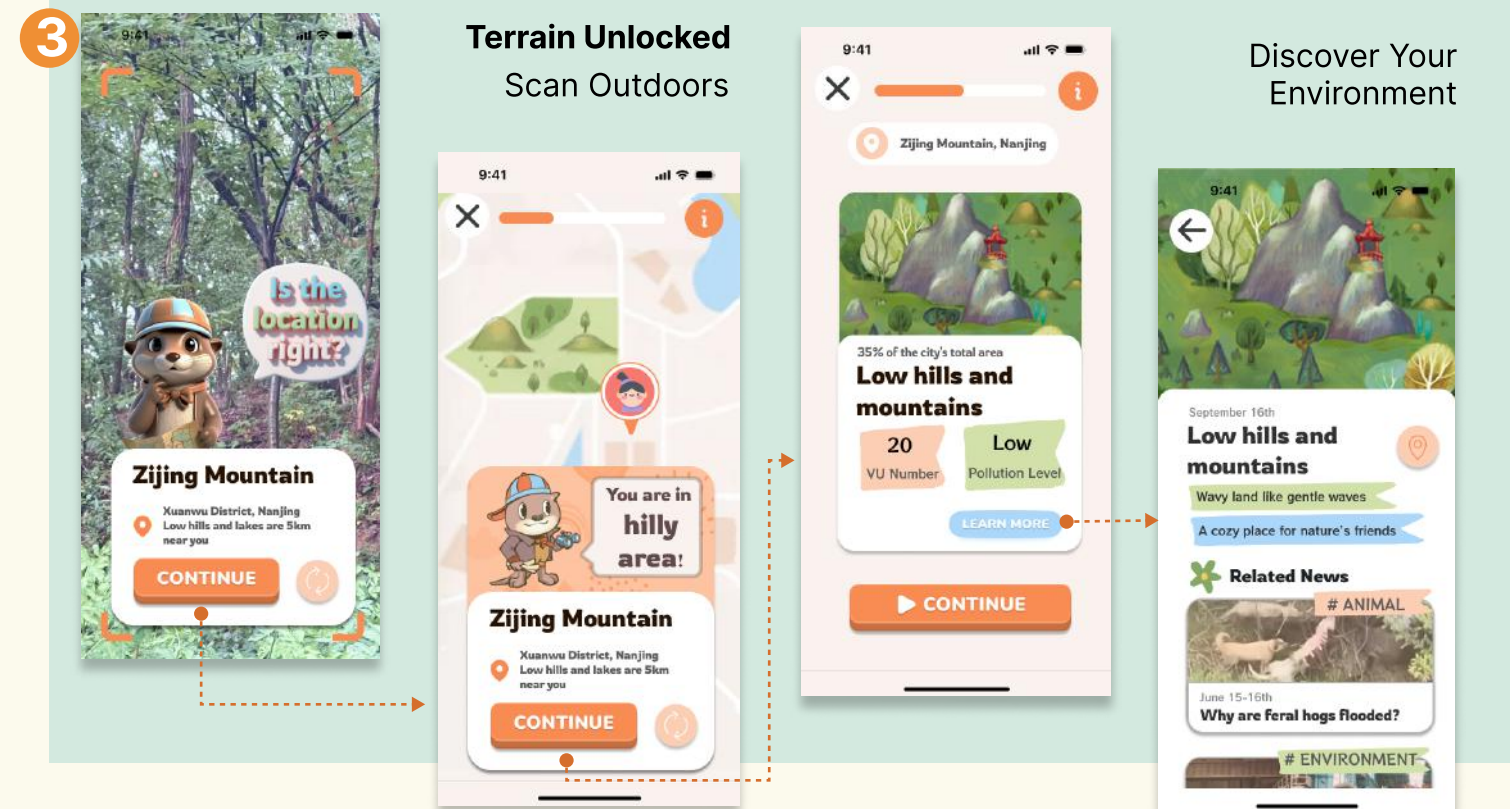
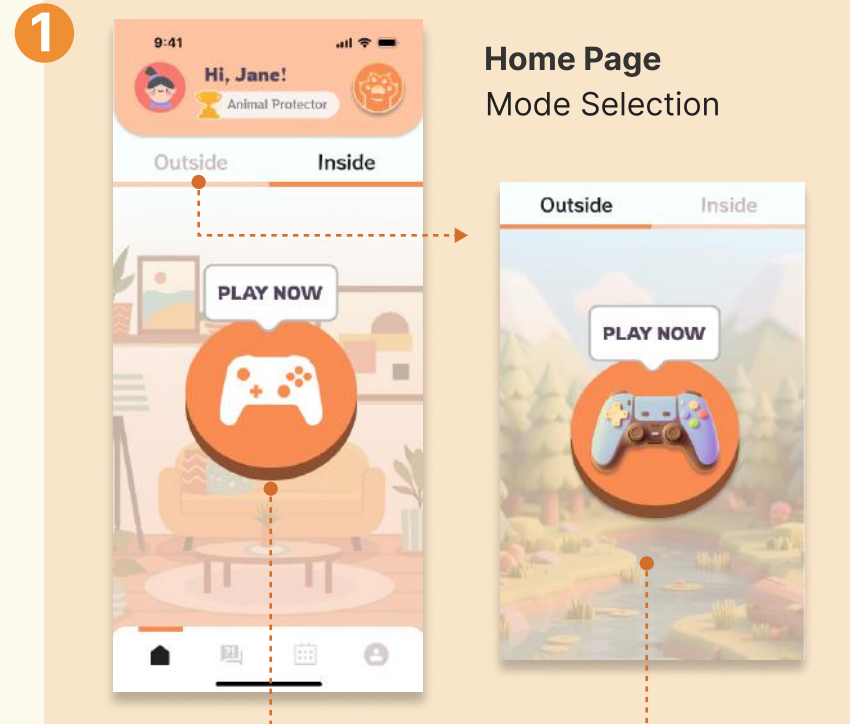
## Other AR Interface Elements

- **Stylized 3D Text Prompts**
  - Key instructions are displayed using 3D cartoon-style English text
- **Geometric Visual Cues**
  - Decorative spheres, rings, and curves are integrated into the AR scenes as playful visuals and directional guides
- **Simplified Terrain Models**
  - Recognized terrains are rendered using low-poly cartoon-style 3D models



# App Design

## High-Fidelit



# Final Outcome - Interior Boardgame

## Game Set Up

The cards serve as both game tools and educational resources. Scanning these cards unlocks immersive content, enhancing learning and empathy by allowing players to experience the animals' world firsthand.



The game board is designed as a vibrant, detailed map inspired by local landscapes, featuring diverse habitats. Each habitat introduces players to the unique challenges faced by vulnerable animals in these environments.

## Tool Cards, Clue Cards and Events Cards



## Details

Game play emphasizes parent-child cooperation, strategic thinking and emotional engagement. Players develop a personal connection through exploration and AR interactions with vulnerable animals, leading to a better understanding of wildlife conservation.

