



Sustainability & Environment

Team Mars

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The background features several teal-colored circles of varying sizes. A large circle is on the left, with a smaller one partially overlapping it. Another large circle is on the right, with a small ring-like circle inside it. A light teal circle is at the bottom left, and a small dark teal circle is near the bottom of the left circle.

Concept Description

Concept Name: ENV Manager

Problem Space: Sustainability & Environment

Target Audience: Children aged 9-12

Context: Classroom

Experience: understanding the environmental challenges by self-exploring



Facing environmental challenges

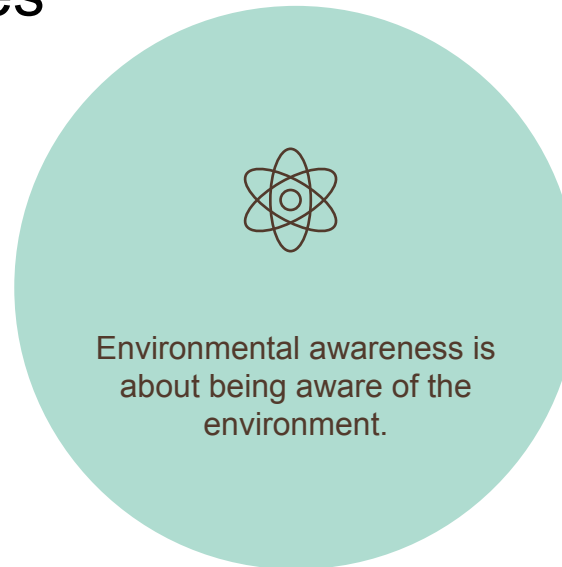
Global Warming

Climate Change

Water Scarcity

Natural Disaster

Negative Impacts on Individuals



Recognized the importance of sustainable environment

Educate kids from young

Especially the kids aged 9-12 year old

Inspiration



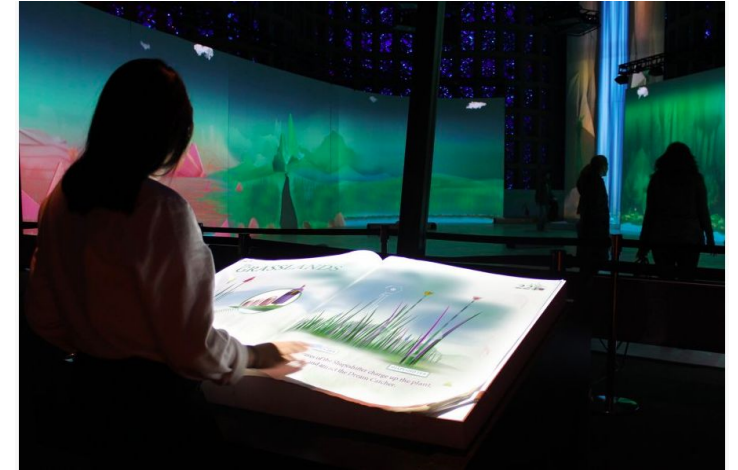
Biosphere's wastewater treatment plant

Utilises the wetlands natural system to clean the museum's wastewater mainly for encourage people action and become involved with environmental issues.



Connecting! Block Town

Encourages the kids to design their own transportation network, utilising the physical wooden blocks to connect an evolving system.



Living Library

Designed for kids to understand the plants and their living areas, through interacting with large projected book.

Major Achievements



Physical factory & trees



Actions detected



Connection of physical input and display on screen



Setbacks

Automatically closed Door

Make the door close automatically after open it.

- placed a spring in the back to give it a reaction force
- set a nail in the front of door to avoid the door going out

Outputs from Arduino

Keep sending messages only need once

- set boolean objects to each button to restrict the loop method

Improvement Justification

	Initial Concept	Current Concept
Target audience	Children aged 6 -12	Children aged 9 - 12
Number of players	Single player	Multi-players (2-3 people)
Physical Interaction from	Cards only	Physical elements, Card collection
Place of Installation	Museum	Classroom

Conceptual Model



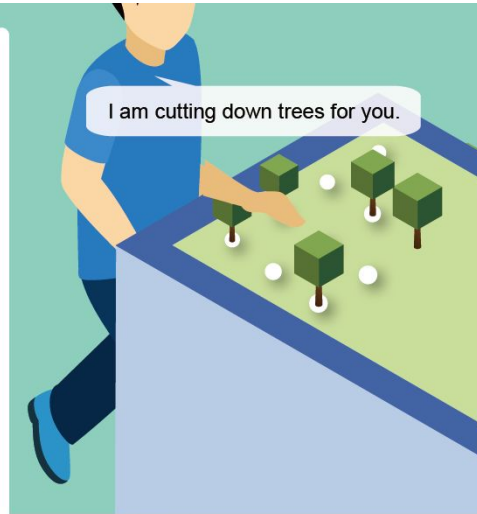
<u>Interaction Paradigm</u>	<u>Interaction Mode</u>	<u>Key Interface Metaphors</u>
GUI(on screen), Physical factory, Digital desktop (large scale & collaborative)	Exploring, Instructing, Cooperating	Three bars like health bar in other games

Interaction Plan With Storyboard

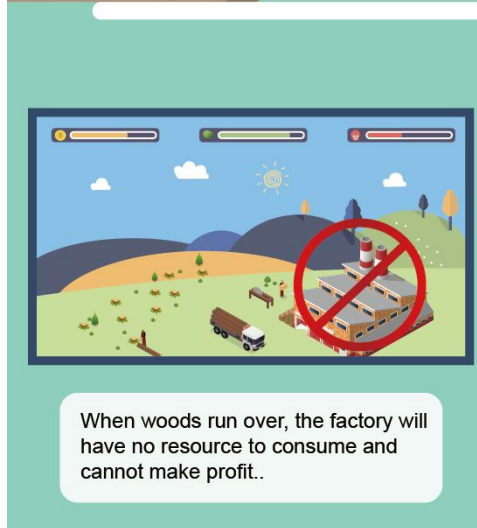
1. provide an instruction
& start game



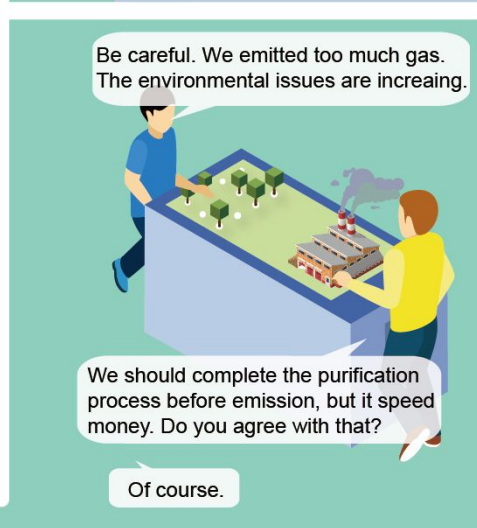
2. allocate works
& complete tasks collaboratively



3. trees is decreasing
& gas is accumulating



4. manage resources
& reduce pollution



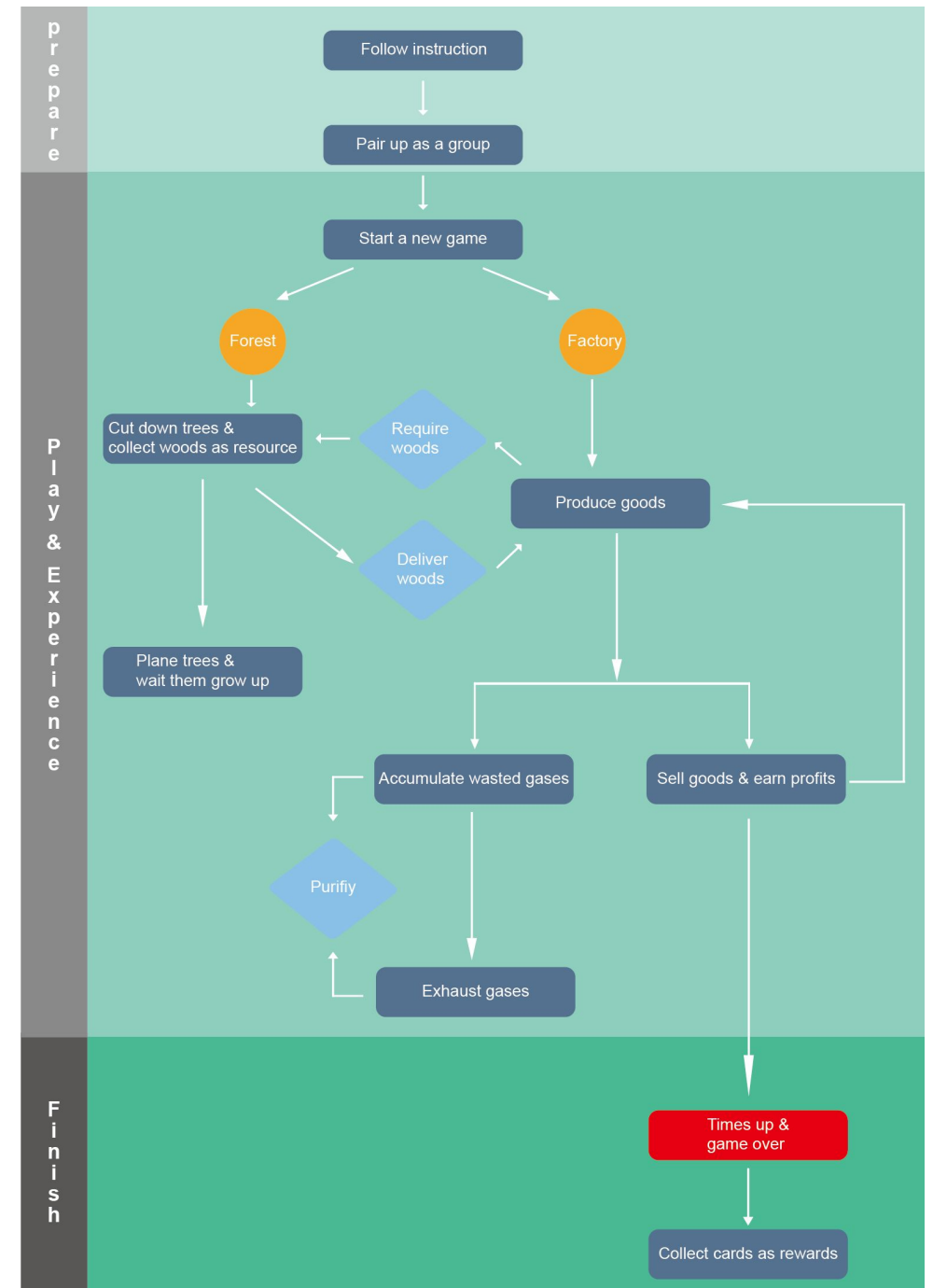
5. make wise decisions together



6. times up and game over

Interaction Structure & Sequencing

Reward Cards



User Journey Map

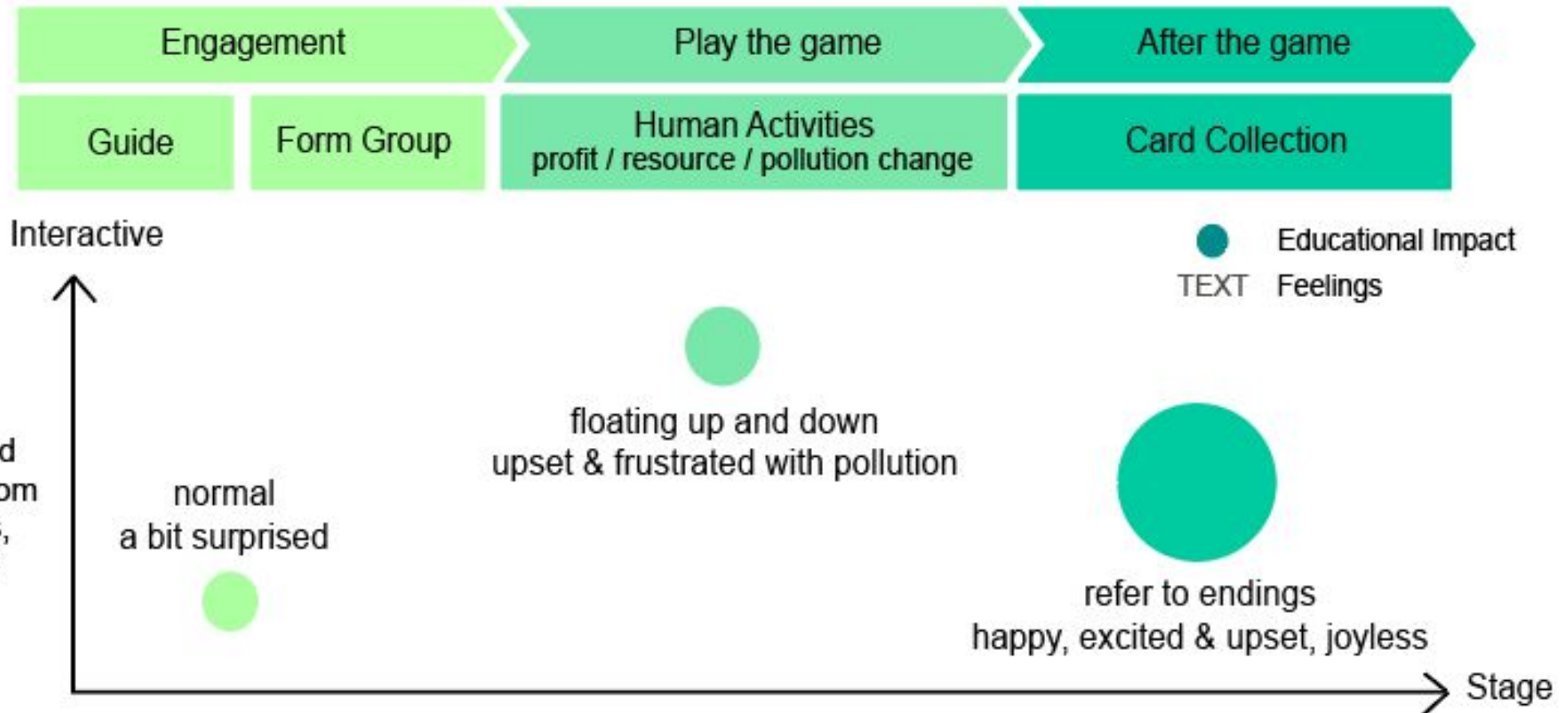
Personas



Kids ages 9-12 years.

Scenario

"ENV manager" is designed to be placed in the classroom for extracurricular activities, which aims to enhance the environmental awareness of the kids aged 9-12.



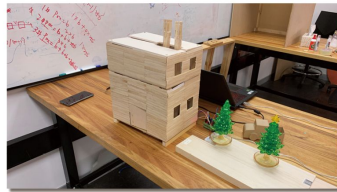
Supporting Materials

Poster

ENV Manager

My team is working on the problem space, namely "Sustainable & Environment". According to research, currently the environment is facing an increasing number of environmental challenges. They cause not only the global environment problems, such as global warming, climate change, water scarcity and etc, but also negatively impact on individuals.

So, we aim to raise the public environmental awareness and sustainable thinking, thereby changing people's behaviors about reusing resource and saving energy. Therefore, we are developing an education-oriented game called "ENV Manager" for our target audience, children aged 9-12. It is designed to be placed in the classroom as an supplementary tool for teachers which helps them teach students to raise environmental awareness. When players are experiencing this game, they need to balance sensible resource use, sustainable business development and environmental protection.



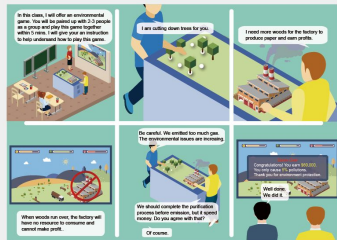
▲ Physical prototype



▲ GUI projected on screen

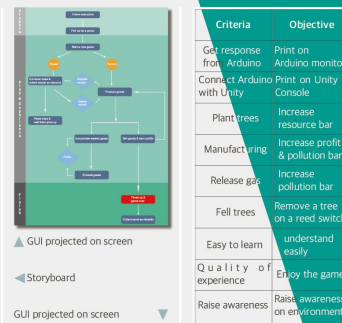
Interaction Plan

At the beginning, teacher will provide a brief instruction and then pair up young students as a group. After that, they are allowed to start playing this game. Players are able to allocate their works and complete some tasks collaboratively. For instance, if player take the main responsibility on working on forest area, his/her job will be to cut down the trees and collect woods as resource. Other player will focus on factory zone and his/her job will be to produce goods in order to launch the factory and earn profits. Due to large size of the panel and long distance between forest and factory, it might be difficult for a single player to run around the panel and operate all parts individually. Then, the number of trees is decreasing as well as exhaust gas is accumulating.



Each move will need an amount of time to finish. It is important to note that the level of pollution will increase the required time to plant a tree, which will affect both the speed of resource regeneration and the efficiency on making profits. Thus, the heart of to win this game is cooperating and making wise decisions together. Finally, times up and game over. In order to encourage players to play until the end and attempt multiple times, cards related to the game will be given to participants as rewards. There are two ways to receive cards: one is triggering one of endings and another one is achieving hidden tasks in the game.

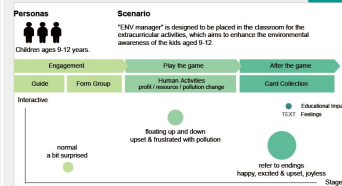
Success Criteria



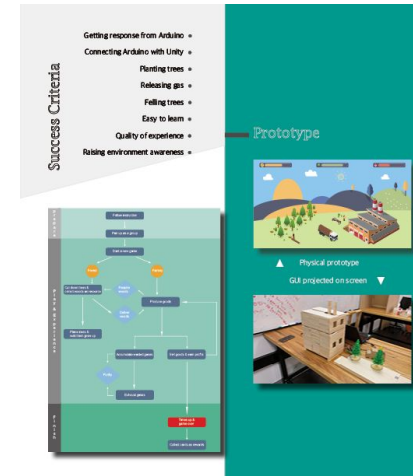
▲ GUI projected on screen

◀ Storyboard

GUI projected on screen ▼



Brochure



ENV Manager

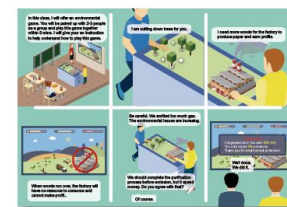


Team Mars

Interaction Plan

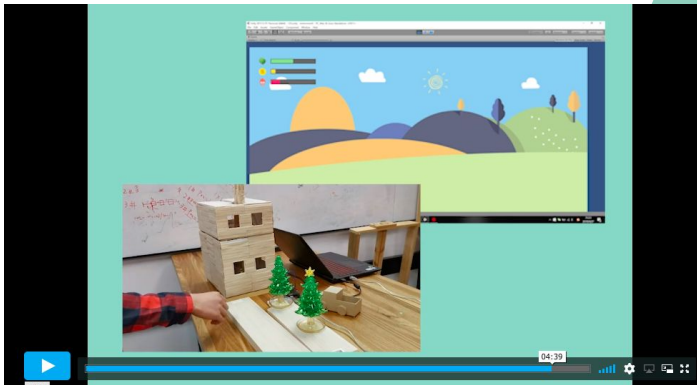
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Explainer Video

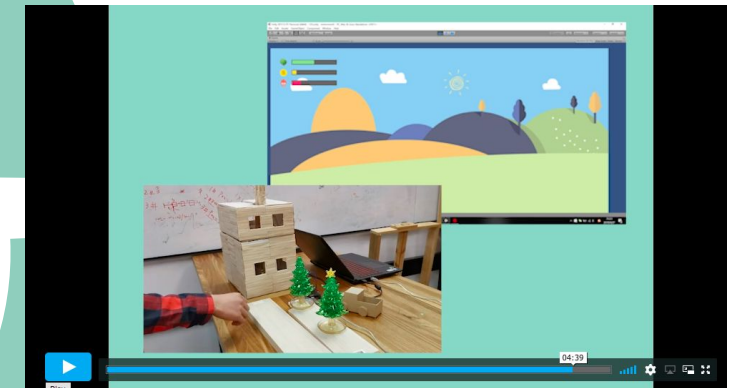
Project Overview



Storyboard



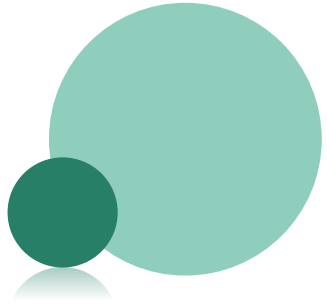
Demonstration



<https://vimeo.com/333661610>

Project Objectives & Success Criteria

Objectives	Success Criteria	Measurement
Get response from Arduino	Print expected text (such as “factoryin1”, “factoryout1”, etc.) on Arduino monitor when pressing a button or attach a magnet on a reed switch	Error-rated performance
Connecting Arduino with Unity	Print expected text on Unity Console when pressing a button or attach a magnet on a reed switch	Error-rated performance
Planting trees	Increase resource bar, decrease pollution bar and reduce profit bar when attach a tree on a reed switch	Error-rated performance
Manufacturing	Increase profit bar and pollution bar when putting trees into the factory	Error-rated performance
Releasing gas	Increase the pollution bar and release black gas when pressing the left chimney;	Error-rated performance
Felling trees	Reduce resource bar and increase pollution bar when remove a tree on a reed switch	Error-rated performance
Easy to learn	Player can understand what to do easily via reading the tutorial, a short-period of learning or watching others to play	Time on task or error rate, after given amount of use and compared with initial performance
Quality of experience	Players should enjoy the game, be willing to re-play and recommend others to play	Average score on questionnaire



Prototype Demo



Thanks for listening :)