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PORT FOLIO

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Contents

The Deserter

Summary

The poster I designed for the game expresses a feeling of being chased. In the game, the hero is constantly being chased, and he crawls forward desperately in order to survive. However, there are countless pairs of hands behind him eager to grab him, which hints there will be several enemies. In the poster, these hands occupy 1/3 of the screen because I want the scene to be more oppressive.

Game Information

Name: The Deserter
Platform: PC
Game Ref: Endoparasitic, Getting over it with Bennett Foddy, Disc Room
Audience: Players who like horror games and want to challenge themselves

User Tags: Single Player, Action, Survival Horror
Art Style: 2.5D, dark story, bloody environments

Background

Human trafficking is a severe issue in Southeast Asia, notably highlighted by a well-known transnational incident in 2021. The region has seen a shift from online gambling to scams due to crackdowns and societal factors, causing labor shortages. Exploiting this, fraud groups, often targeting Mandarin-speaking individuals, engage in cross-border operations, subjecting victims, including Chinese tourists, to forced illegal activities. My game is created against the backdrop of this societal context.

Screenshots
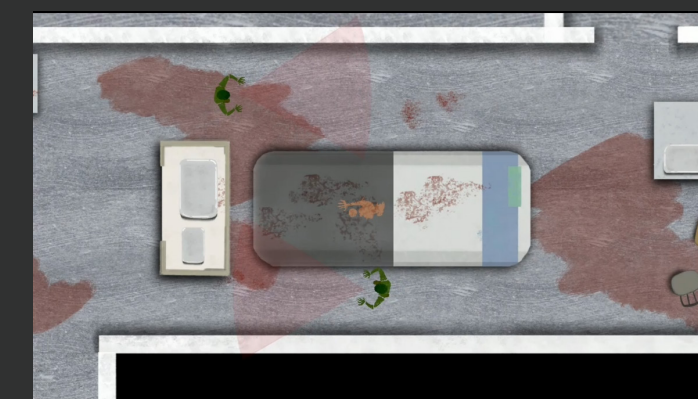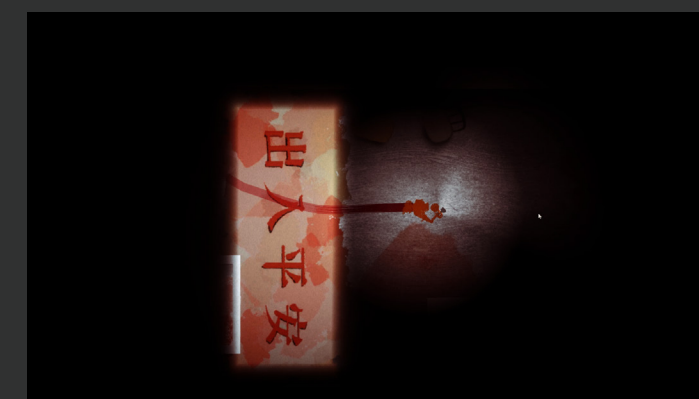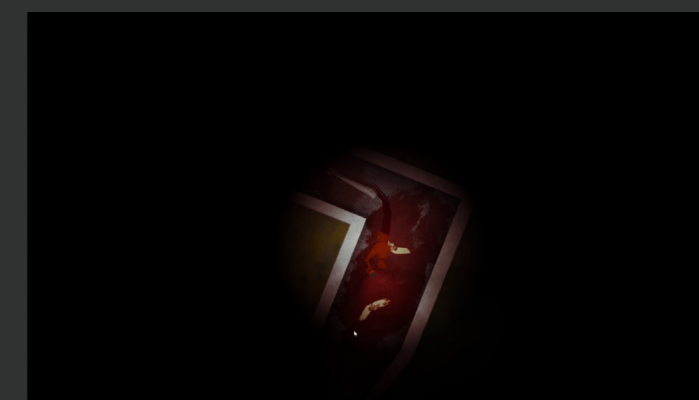
Main Gameplay

This is a 2D escape themed game. As a victim of abduction and trafficking here, the player wants to survive and escape from this place and general buildings after losing both legs and an arm. To live is his only belief. The player slides to control the left arm of the game character.


The direction the mouse moves represents where the character will go next. Pressing the left mouse button means the character is grabbing the floor. By sliding the mouse while pressing the left mouse button, the character can move. The speed of movement is based on the player's operation frequency.

Pointer Affect Hand Direction

Click to Drag Body Move

Enemy Design
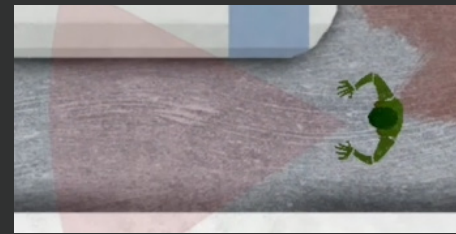
1. Enemy Type 1 – Scorpions + Mice

The body structures of scorpions and mice are well-suited for deconstruction into segments. Scorpions possess venom and favor damp and warm environments, making them fitting inhabitants for the grimy, chaotic building.
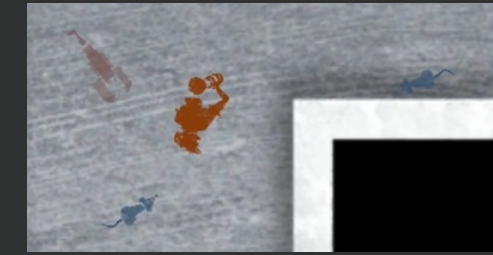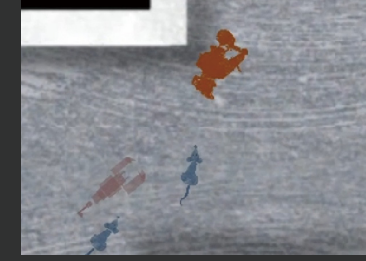
The presence of mice in such a dilapidated place is also plausible. These two enemy types are numerous and have relatively low attack power. If the player is attacked by them, they won't die immediately; death occurs after accumulating a certain number of attacks.

2. Enemy Type 2 – Guards

Given the top-down view of the entire game, guards are depicted as intact humans, with only their heads and shoulders visible to players. Their numbers are limited, and they follow specific patrol routes.

If a player enters their line of sight, they will be captured instantly, resulting in an immediate game over. Players can evade guards' patrols by hiding under tables or beds.

Cone View

Guards Walking

Sub Machanism

1. Hiding mechanism

The protagonist of the game is a physically disabled person, and it is obviously unrealistic to let him participate in fighting and killing. So when designing the level, I chose to make the character able to avoid the enemy's pursuit by hiding.

When the player controls the character to hide in the designated object, the enemies will stop chasing. Players can also sneak along this object towards the exit.

Mouse stops chasing

The guards are still petrolling when the protagonist is hiding.

Players can hide and give themselves some time to rest when being chased. And you can check your location and find the exit. Players can also find good opportunities when hiding to avoid guard patrols.
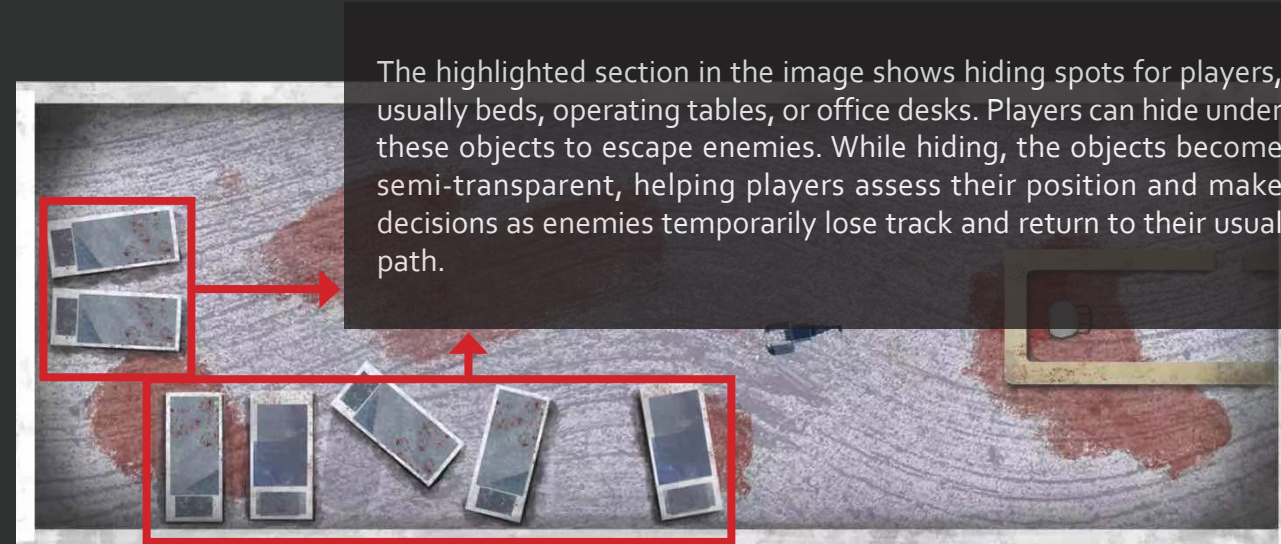
The highlighted section in the image shows hiding spots for players, usually beds, operating tables, or office desks. Players can hide under these objects to escape enemies. While hiding, the objects become semi-transparent, helping players assess their position and make decisions as enemies temporarily lose track and return to their usual path.
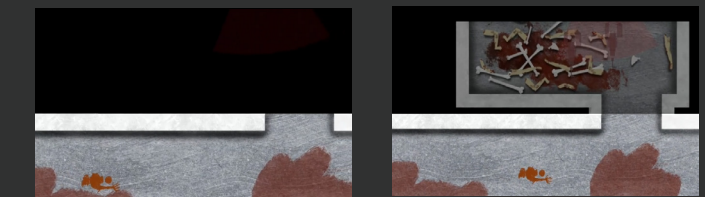
2. Automatic Door
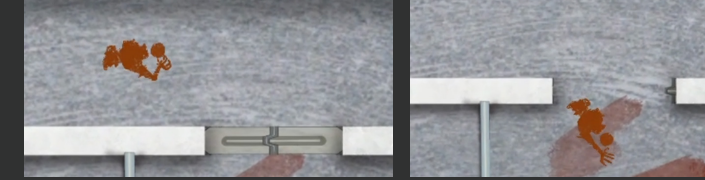
Upon entering a large room, players encounter an automatic door at the entrance. They are informed that once this door closes, they will be safe. However, this safety comes at the cost of new enemies about to appear.

3. Button Controlled Door

出入平安

Players can press buttons to shut the door to isolate themselves from pursuing enemies.
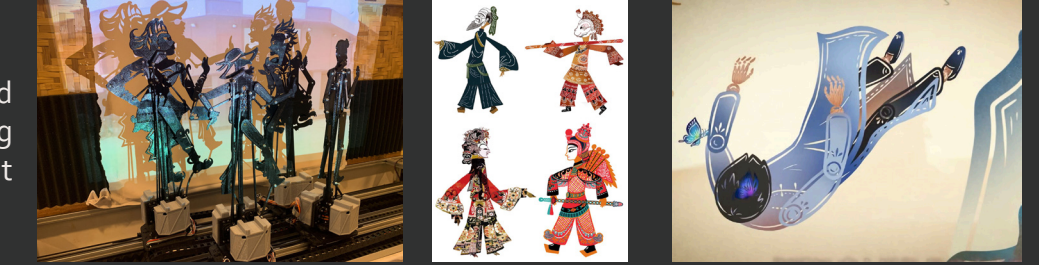
4. Hidden Space

There is a hidden area filled with enemies, designed for a jump scare. The sudden fright adds to the game's difficulty and enjoyment.

Aesthetic Design

Overall Art Style

I drew inspiration from ink painting and Chinese shadow puppetry, incorporating a distinctive East Asian cultural style that aligns well with the thematic elements.
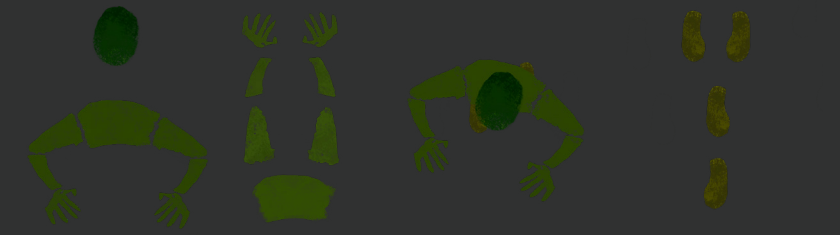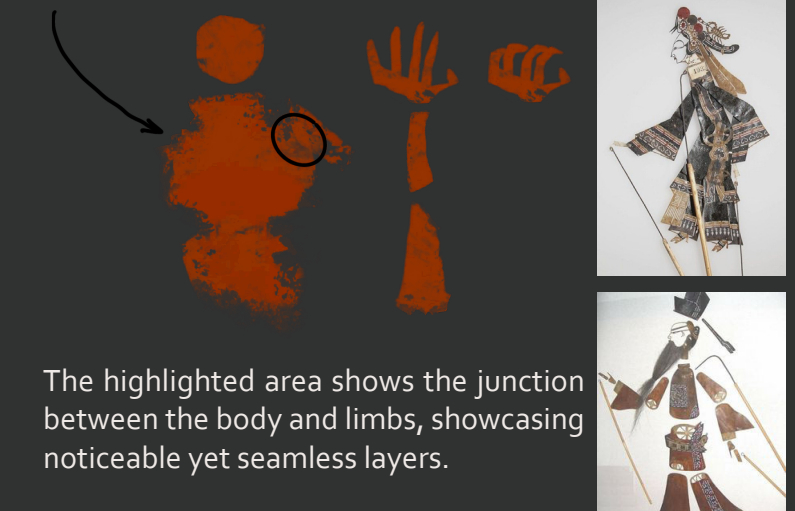
I aimed to avoid using excessively gory visuals to depict dismemberment, and this art style effectively avoids such situations.

Protagonist Design

The connection between the protagonist's arm and body is severed, yet the integration of shadow puppetry aesthetics ensures that this junction appears seamless and harmonious.

This brushwork exhibits a sense of depth, imparting a fragmented sensation.

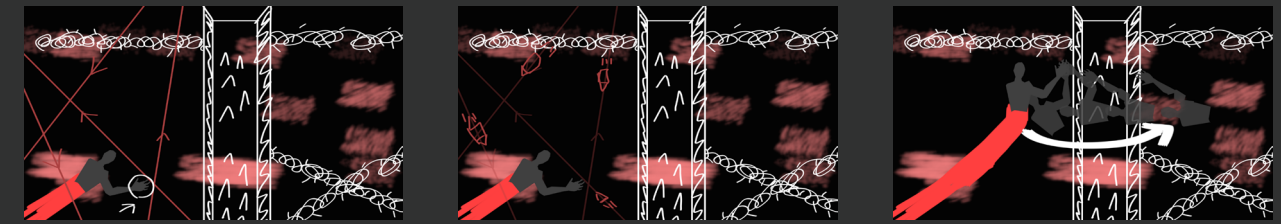Top Down View Guards Body Parts and Foot Print

The highlighted area shows the junction between the body and limbs, showcasing noticeable yet seamless layers.
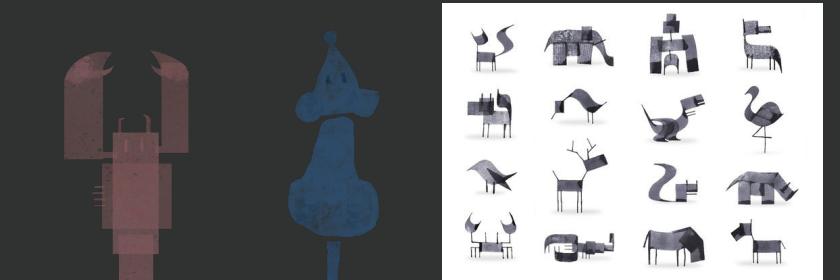
Art Ref
to
Mouse & scorpion

Project process

Concept: A crippled body cannot suppress one's pursuit of spiritual freedom.

Keywords: Physical Torture   Mental Control

1. Concept 1: Second World War

The protagonist, a wartime soldier (era unclear, potentially WWII), is gravely injured, losing their left arm and both legs, with only their right arm and torso remaining. Despite ongoing frontline warfare, their intense will to survive drives them to drag themselves away from danger using their right arm.

3. Concept 3: Burma's Scam Syndicate

While advancing the theme of the malevolent Buddha, I couldn't help but notice the news surrounding scam criminal syndicates in Burma, which left a profound impact on me. I believe that, rather than crafting a fictional story, it's crucial to focus on real societal phenomena and critique them. Therefore, I pivoted the game's theme to align with the current scenario.

Headline:

While delving into the investigation of scam networks in Myanmar, I stumbled upon what locals refer to as a 'flesh-and-blood island'

No More Bets

2. Concept 2: Buddhism (Cult Version)

Buddhism, as the sect with the largest number of believers in Southeast Asia, has a great spread and influence. When it comes to places such as Thailand and Myanmar, the first thing people think of is temples and Buddha statues. However, faith is also the most prone to extremes. So I seized this point as the entry of my story, which made the players feel more convincing and recognized the setting of the story.

At first my characters looked more like real humans. But this was a bit bland and featureless, so I found the current ink-wash style painting method while doing research. I applied this method to my character design.

Test Version In Unity
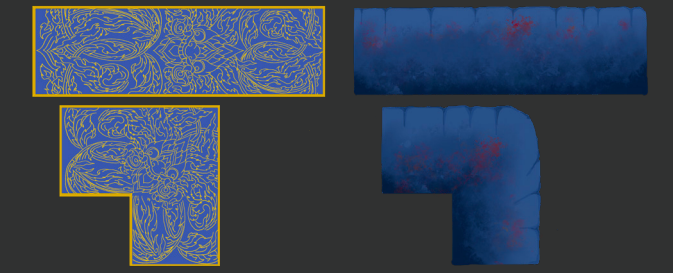
Amidst a delightful family vacation in a tranquil city, the protagonist and his loved ones stumbled upon an enigmatic Buddhist temple. Its eerie darkness and desolation puzzled them. Intrigued yet unnerved by the strange murals on the walls depicting wrathful Buddhas and sacrificial scenes, they felt an unsettling sensation. The tour guide insisted on a final glimpse of the grand Buddha statue, but as they entered the temple's heart, the incense's peculiar scent overwhelmed them. They lost consciousness and awoke to find themselves confined in a sunless chamber, surrounded by an unfolding mystery.

Game Map

The entire game consists of two map layers: an underground research facility and an office area, 13 regions in total. The game's background story unfolds in a remote area with strong religious beliefs. Level 1 provides a intense chasing experience to quickly immerse players in the survival scenario. Level 2 focuses more on information delivery and theme reverse.

Flow map -- intensity
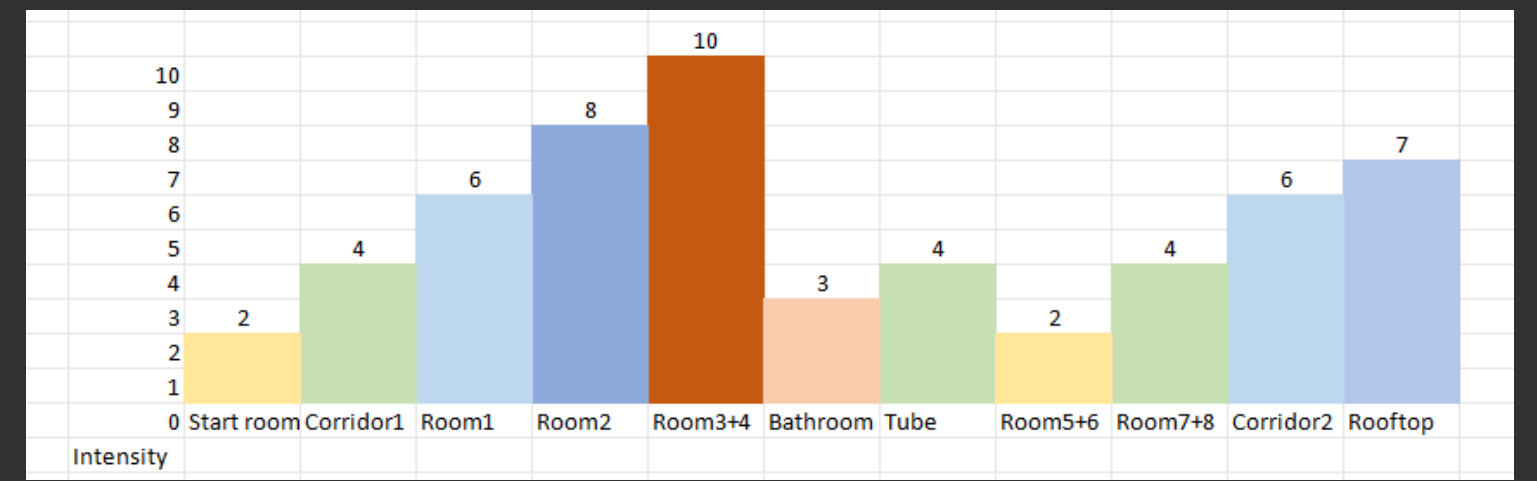
The intensity progression of different levels in the game is illustrated in the above diagram. We need to grip the player's interest by following the narrative structure of beginning, development, climax, and conclusion. Balancing moments of relaxation and excitement is the most suitable approach.

References

1. The Mawaadi-KK Zone in Myanmar

In scam hubs, a miniature society often takes shape, with well-organized internal functional areas. The controlled population has their dietary and other life needs met quite comprehensively, forming a self-contained ecosystem

2. Game Map Ref

The maps in the Resident Evil series have consistently been both exquisitely crafted and cleverly designed, making them excellent points of reference.

Level Design – Level 1 Run Through

The primary focus of the first level is to establish the concept of a terrifying atmosphere for the entire game. From the initial small room to the final restroom ventilation duct on the ground floor, each element conveys to the player the urgency to escape quickly, as this place is perilous. The narrow and confined corridors provide players with a specific path to follow while also instilling a sense of oppression.


▲ Enemies   ● Guards
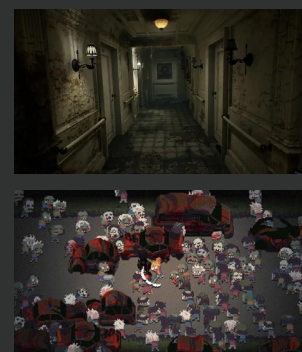
When entering different small rooms, the player will encounter varying numbers of enemies that pursue them. Originally, during the design phase, I intended for players to use a dash maneuver to evade attacks.
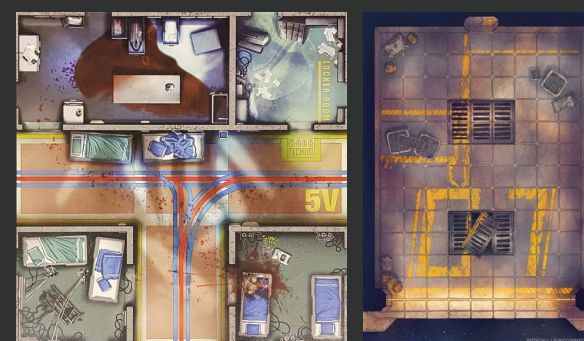
However, considering factors like energy bar recovery rates and other numerical aspects, we decided to provide players with an alternative way to avoid danger—hiding. In rooms with a higher number of enemies, we introduced scene-appropriate objects that players can use for concealment.

For example, in the two images provided, players can hide under the bed to escape the pursuit of the guard mice and scorpions. While in hiding, enemies lose track of the player. The object the player is hiding behind becomes semi-transparent, allowing the player to maintain a clear view of their concealed position.
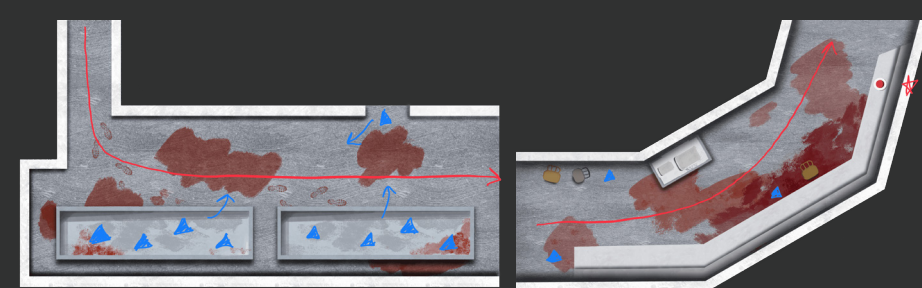
The two narrower rooms have a higher level of gameplay intensity. Players tend to remain cautious in environments where they can observe the entirety of the map, paying attention to where enemies might emerge. Therefore, we strategically placed a significant number of scorpion mice in these rooms.

The intention behind this design choice is to help players understand that the abundance of enemies serves to discourage them from lingering and motivate them to swiftly progress to the next area.
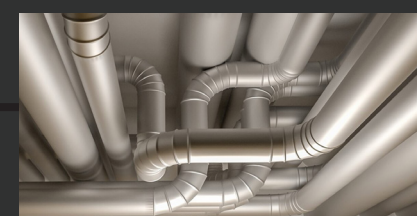
The spacious bathroom area provides players with a temporary moment of respite. After a prolonged pursuit, players' heightened focus requires a slight relaxation. This segment corresponds to a dip in the intensity curve of the level.

I believe that the decision to have the escape from the restroom ventilation duct to the second floor adds more complexity to the story, which is why I made this choice. Crawling through a narrow passage allows players who have just relaxed to gradually build up tension again.

Some references i found during designing levels.
The topdown view of a map and there are several rooms

Level Design – Level 2 Run Through

1. Enter the bizzare world

After leaving the incinerator, the player crawls into a profoundly sacred room. As a vital part of the religion, offerings and prayers are indispensable. In a brainwashing cult like this, prayer holds immense significance, making this room a designated prayer chamber.

2. Climax of the story

In the prayer chamber, the player discovers a large hole leading to the adjacent room, which happens to be the organization's leadership office.

Both of these levels are virtually devoid of enemies, but the focus lies in crafting the atmosphere. Players can imagine that while they are praying, the leader next door is secretly eavesdropping. The devoted prayers of the cultists are seen as potential leverage by the leader, a tool to manipulate their thoughts and beliefs.

3. Close to the truth

After passing through those two mysterious rooms, at this moment, players need some time to contemplate and organize the information they've just obtained. Therefore, this relatively leisurely corridor serves as a buffering point. Once players have some understandings of a certain amount of information, the intensity of the level gradually increases. This intensity keeps rising until players finally reach the end of the game—the rooftop.

4. Ending
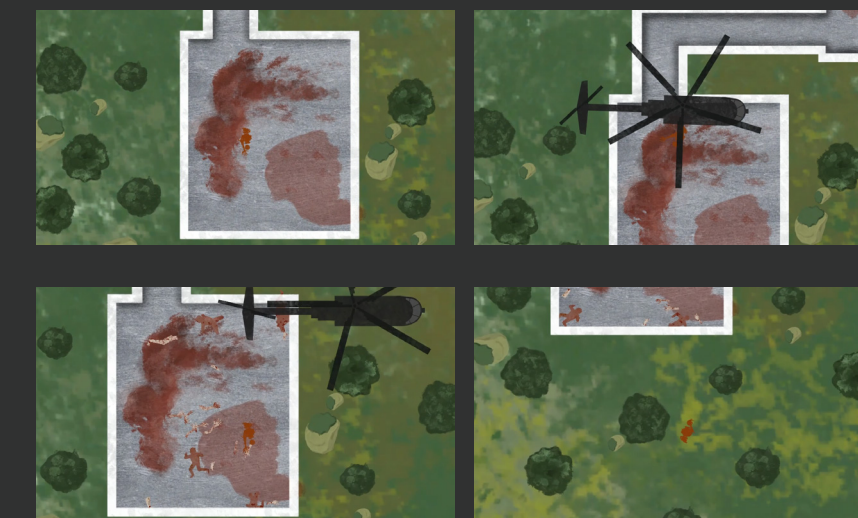
The Rooftop and the Helicopter:

After players struggle to reach the rooftop, they gaze at the sky and the helicopter awaiting on the rooftop. They feel a sense of relief, believing they can finally escape from this place of turmoil. However, the helicopter drops off more victims, leaving the protagonist in utter despair. With a heavy heart, the protagonist jumps off the floor, bringing an end to their own life.

Behind the Game Scene

Problem solving

When we were making the map, my classmates in the programming department and I tried to use some simpler and faster methods to quickly complete the art part of the map.


So we decided to first use blocks to build each level, and then convert each block into the corresponding material. This method works great for solid color backgrounds, but the art in this game is ink style. Ink painting will have very beautiful brush marks, so the ink style is not suitable for this method because the splicing is too obvious.

Test & refine
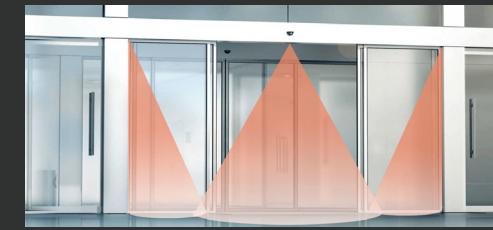
At the beginning of the design, the connection of each room was not considered, so there was only a bare door frame. During the trial play, we found that these parts were very abrupt, and the players did not have a sense of accomplishment and excitement. So my team and I decided to add a sensor door in front of the new area.
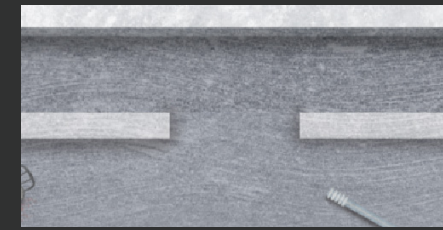
When the player is being chased by the enemy, the temporarily closed door ahead provides them with a lot of excitement.

What's next & future form

If there is a chance to refine my game, I would like to add some resources. Such as energy bars, blood bars, and supplies. These concepts will give players more desires to explore. The original game only required players to exit safely. If I add these, players will need to pay attention to the data of the energy bar at all times, and use the energy wisely.

And the addition of health bars and supplies will give players more intensed and exciting gameplay experience. They need to keep themselves alive. It also encourages players to explore every corner of the map to find resources.

UI & interactions

My UI design has very similar pattern to the background, and I also chose a striking gray-blue color scheme. It looks very eye-catching in the title and fits well with the gray background in the game.

Final Outcome

The game took almost 40 days to complete. During this time, I deeply experienced the importance of communication. Communication between production game designers and programmers is crucial in game development. What I didn't pay much attention to when I was making games by myself will cause a lot of trouble for both parties in teamwork. For example, I made many mistakes in standardizing the resolution and size of art output, which eventually led to constant redrawing. Fortunately, we often conduct zoom meetings to communicate with the problems we find in a timely manner.

Design docs are very useful in upfront work. I try to write the design document of my game in as much detail as possible, explaining the gameplay mechanism, level design, character characteristics, etc. of the game. The programmers in the group understand my design ideas and desired effects by reading the documents, and code accordingly.

Regular meeting discussions allow designers and programmers to discuss the progress and challenges of the game. Designers can explain their ideas, and programmers can provide technical advice and constraints. In conclusion, good communication between designers and programmers is the key to the success of game development, ensuring that the final game experience is consistent with the original vision.

Milestones	Research	Prototype	Playtest & Refine	Final Build
Weeks	1	2~5	6~7	8
Goals	Determine the development direction of each department	Make a playable prototype that shows the core game mechanic and game flow	Improve gameplay experience and make the game flow more refined	Market Test
Game Design	Conduct research and analysis on existing similar games(Endoparasite)	Write game design documents for all rules and data	Collect players data and adjust core mechanic or levels	Make future plans based on all collected data
	Think about game themes and background stories	Make the Core game mechanic	make the core mechanic more solid and "identify and rectify deficiencies"	Finish game design documents
	Explore Core game mechanic	Do some adjustment to the data and levels based on the coding and prototypes		
	Make a Persona for audiences(Marketing research)		Update Game Design Documents	
Programming	Learn skills for making this game	Make avatar movement	Refine Enemy AI	Fix all bugs and make sure the game it fully playable
	Conduct research and analysis on existing similar games(Endoparasite)	Make enemy AI(Mouse&Scorpion)	Add auto-door and button for door shut	
	Make a system diagram for the coding structure	Build up the level layout based on art assets and level design diagrams	Make the hideable objects semi-transparent while players hide in	
		Add menus and UIs	Refine the game play experience	
Concept Art	Research art style that might suit the game	Draw scenes based on the level design	Design the protagonist and his moving animation	Refine and updates all art assets
	Make a moodboard and do some sketches	Design decorations in the game scenes	Design enemies and their animation	

Dr.Impossible

You will take on the role of an unscrupulous surgeon in this independent game, tasked with extracting as many organs as possible from patients to maximize profits. Precision is key as you navigate through the surgical procedures, ensuring that the patients don't meet an untimely demise to avoid unnecessary complications. In this world of medical black market dealings, you'll confront moral dilemmas and engage in high-risk operations. Are you prepared to push the boundaries of medical ethics and navigate the challenges of this dark and unconventional medical underworld?
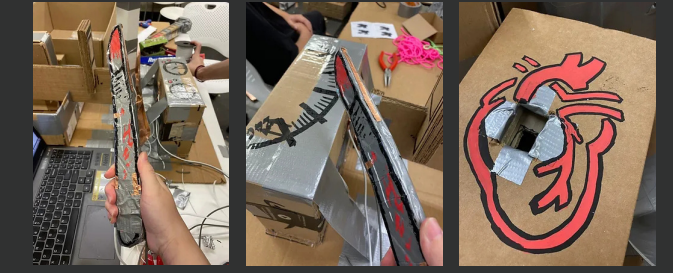
Role
Art, Handwork, Mechanic Design, Programmer

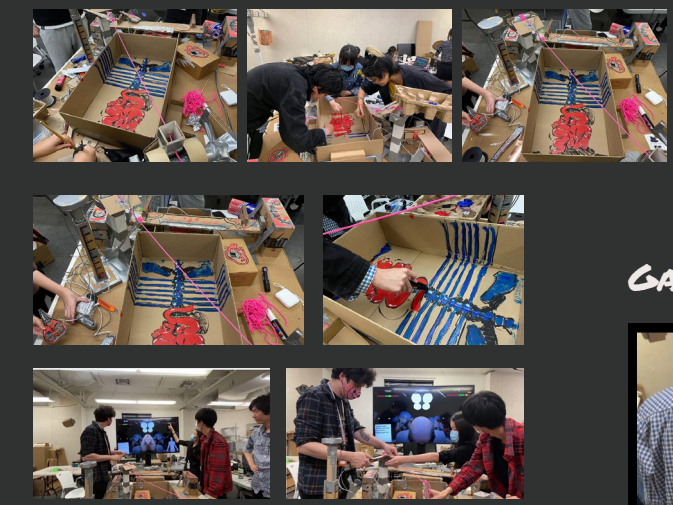**Platform**
Unity, Arduino

Genre
Horror, QTE

Previous Collaborative Work

Early Design Thoughts

We first came up with an idea that players are the doctors who work in an illegal clinic. They need to steal some of the organs during the procedure or accomplish something they want to do, such as signing the patient's organs or eating them.
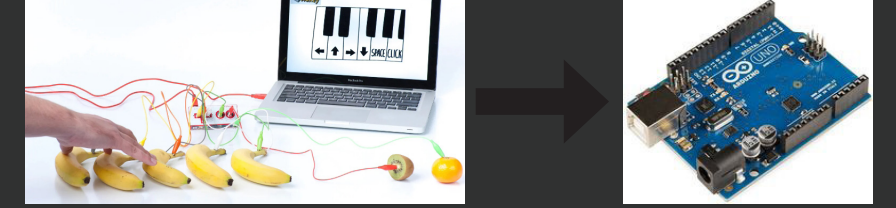

Process

Gaming Screenshots & Video Recording Link

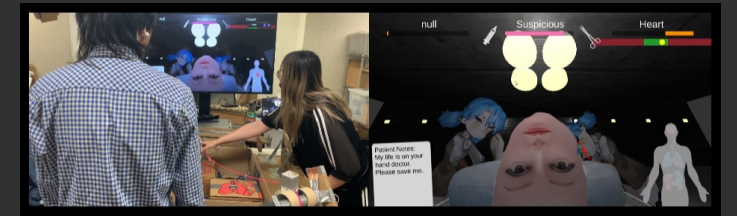https://chenheather130.wixsite.com/website/docsim

New Platform Learnning

Teammates: Qihuan Jiang, Demi Liu, Zifeng Ding, Connor Zhang
My Role: Art, Handwork, Mechanic Design
Duration: 3 Weeks
Platform: Unity, Mackey Mackey
Genre: Horror, QTE

After collaborating on game development using MakeyMakey, I developed a strong interest in device-based games. However, I felt that while MakeyMakey is convenient and beginner-friendly, its functionality is somewhat limited. So, I shifted my focus to Arduino and prepared to learn microcontroller development.

Learning in new domains

During the collaborative project, our gameplay design includes elements related to maintaining a patient's vital signs, such as administering blood transfusions using a syringe. It was during this project's research that I realized the crucial role of an anesthetist in a surgical operation.

There's an old saying in the medical field:

"Surgeons treat diseases, anesthetists save lives."

Anesthetists need to keep the patient's vital signs stable, ensuring the patient survives the surgery, and they even have the authority to halt ongoing surgical procedures. I hope to incorporate the role of an anesthetist into the gameplay, emphasizing the importance of maintaining vital signs.

Dissemination

I've always enjoyed delving into unfamiliar fields when developing a new game, as it allows me to absorb new knowledge during the development process. Additionally, I aspire to pass on the knowledge I acquire through games. Therefore, I aim to create a medical education game with the goal of enabling players to learn basic medical knowledge related to anatomy and medical anesthesia.

My objectives:
1. Learn Arduino.
2. Familiarize myself with Unity and C#.
3. Highlight the significance of anesthetists.
4. Design an educational game (with a focus on knowledge related to reading Patient Monitors).

Background Setting: Organic Trafficking

Article Title: "Your Value in Northern Myanmar"

In Asia, traveling to Cambodia and Myanmar can be quite dangerous, especially in northern Myanmar, which is essentially a 'stay away from strangers' situation.

The film 'Andhadhun' was also part of my inspiration, and I really liked the metaphorical expression of the liver shaped tree at the end of the film

In this game, you work in a shady hospital. This hospital looks very fancy and high-end, but it's an illegal organ trade. As a new member of the group, this is your first surgery. In order to earn the trust of everyone, you must prove your loyalty to the organization with excellent performance!
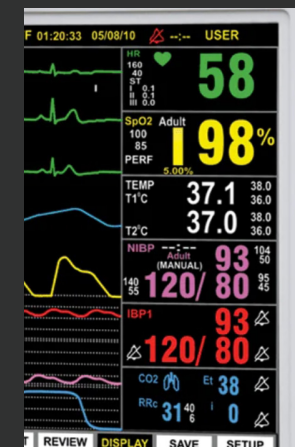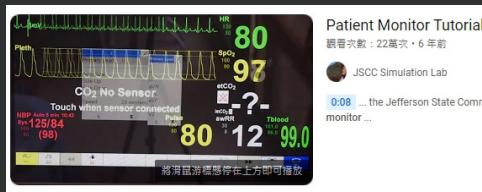
Research

Study of Key Variables in Human Life Signs

HR: Heart Rate
SPO2: Oxygen Saturation
NIBP: Non-Invasive Blood Pressure
IBP: Invasive Blood Pressure
TEMP: Temperature

These five values are the most common metrics used to assess a patient's vital signs. Therefore, I use these five variables as reference baseline values for designing my game system.

*Heart Rate: Typically beats 60 to 100 times per minute.*

Oxygen Saturation: Measures the oxygen content in the blood, with a maximum of 100, typically at 95 or higher. Below 90 indicates insufficient oxygen.

Temperature: Normal body temperature is generally considered to be 98.6 degrees Fahrenheit (37 degrees Celsius).

NIBP and IBP, generally, IBP takes precedence because the latter involves direct vascular measurement, providing more precise readings.

Blood Pressure: Number 1 (Systolic Pressure) should range between 100 and 130, while number 2 (Diastolic Pressure) should range between 60 and 80.

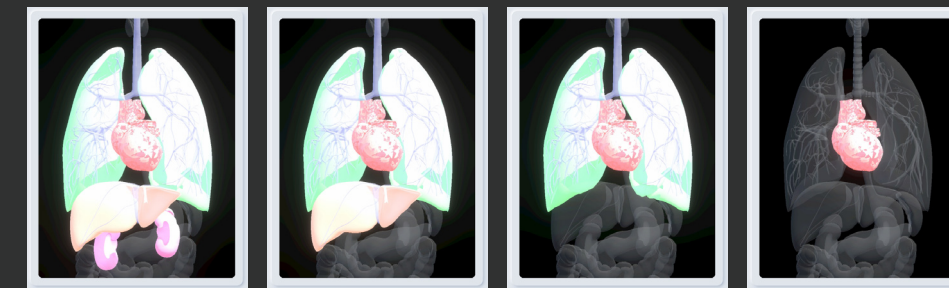# Human Organ Market Circulation Investigation (Black Market)
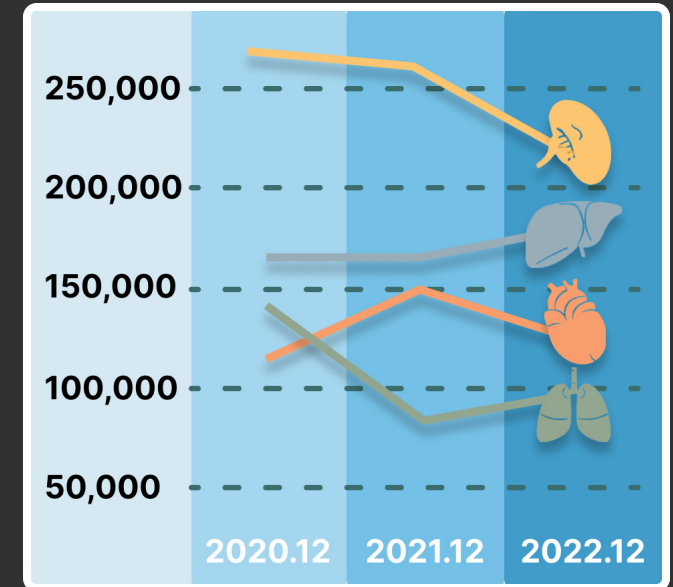
Price fluctuation of human organs on the black market from 2020 to 2022 (kidney for a pair)
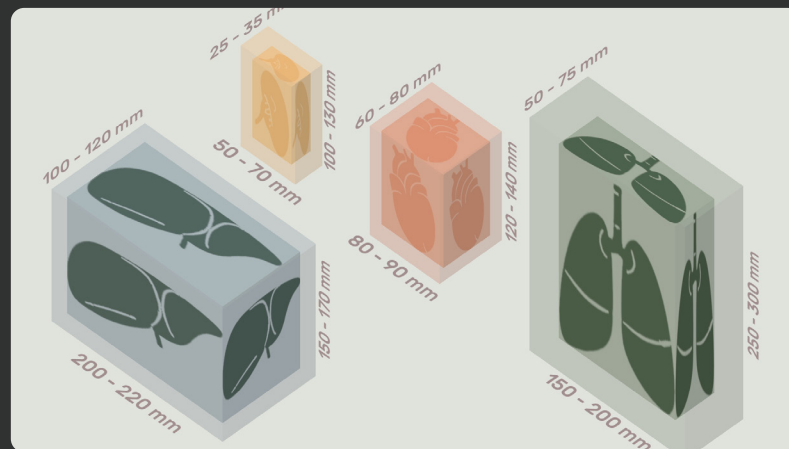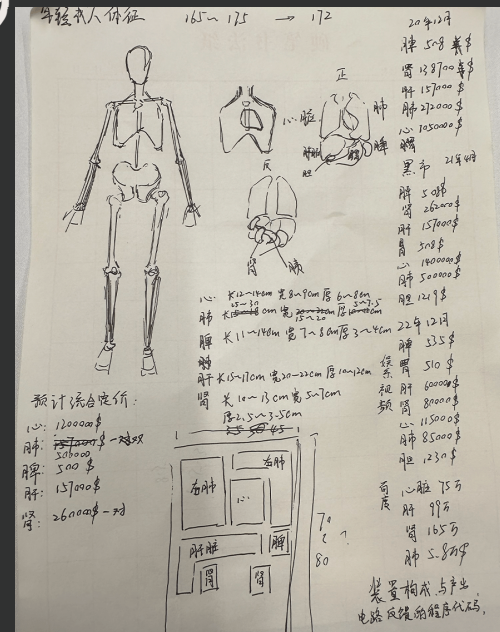
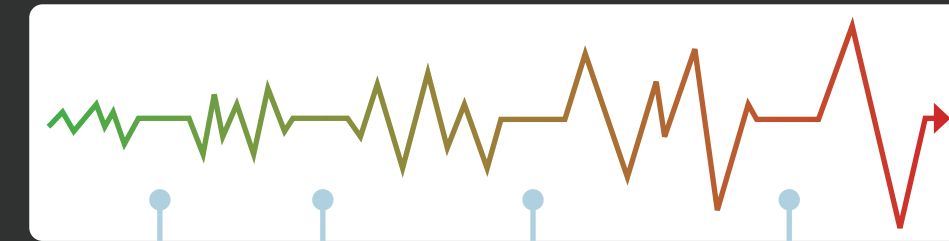
Proportions and Range of Variation in Human Organ Sizes

Gameplay

Goal

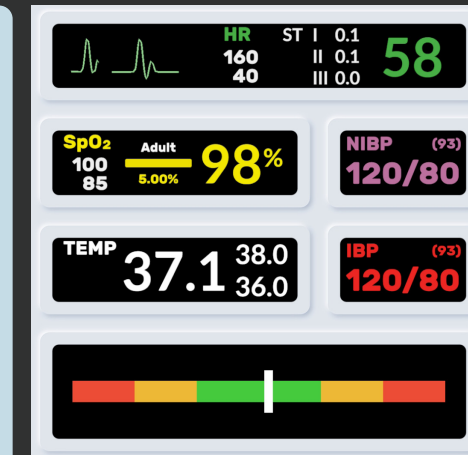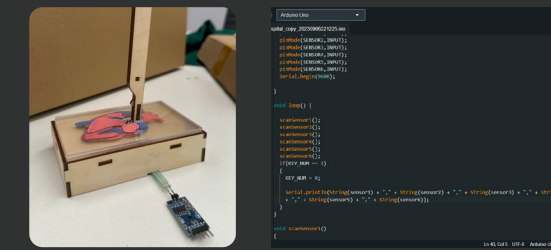Players need to remove all the organs from the patient's body while still keeping the patient alive.
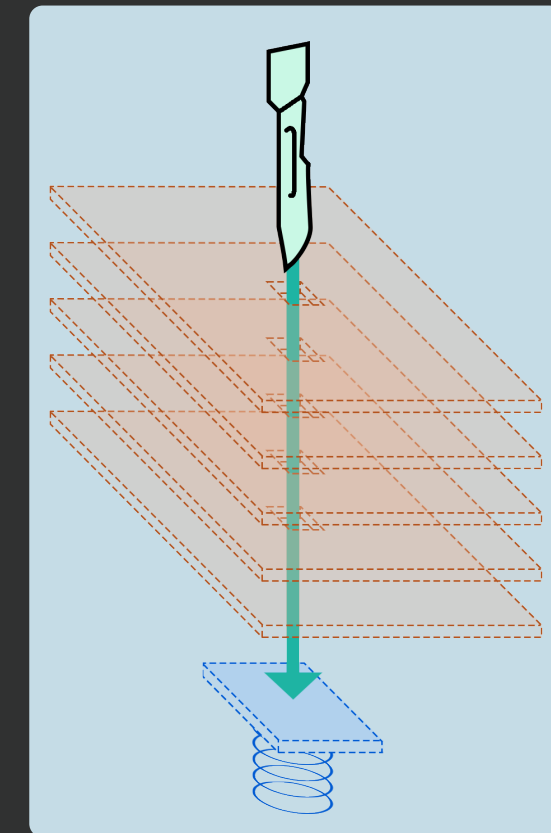
The difficulty curve Every time an organ is removed, the patient's vital signs become more and more unstable

Number Removed

This curve is the overall difficulty trend, but in fact, the proportion of each organ is different. I used the black-market value of organs in my research to distinguish their contribution to difficulty.


Perform Surgery

Core gameplay

The middle Handler will move left and right, seize the opportunity, and poke the organ with a scalpel to remove the operation.

● *Failed*   ● *Succeeded*   ● *Great Succeeded*

10 Mediocre successes = 5 Great successes = Stolen successes

Code Sample

Secondary Gameplay

1. Cardiopulmonary resuscitation
Help patients increase their heart rate by pressing their hands on the heart multiple times (QTE play)
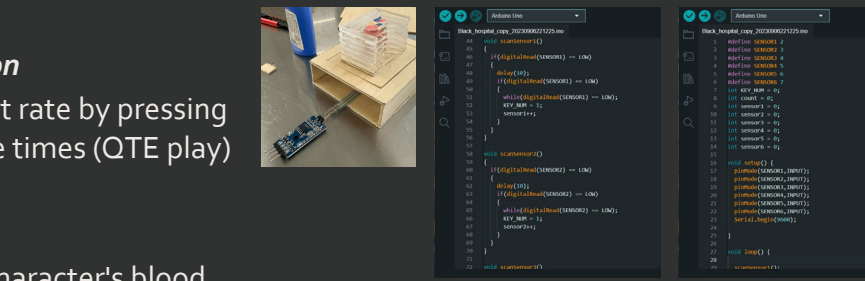
2. Needle Transfusion
Blood transfusions to raise the character's blood pressure

3. Body Temperature = Time Pressure
A drop in central body temperature can have a number of negative effects, such as increasing infection rates and weakening blood clotting. My core gameplay is QTE, and the form of gameplay itself emphasizes time pressure participation, so I use body temperature as a time variable to apply pressure to the player.

Typical curve of hypothermia during surgery
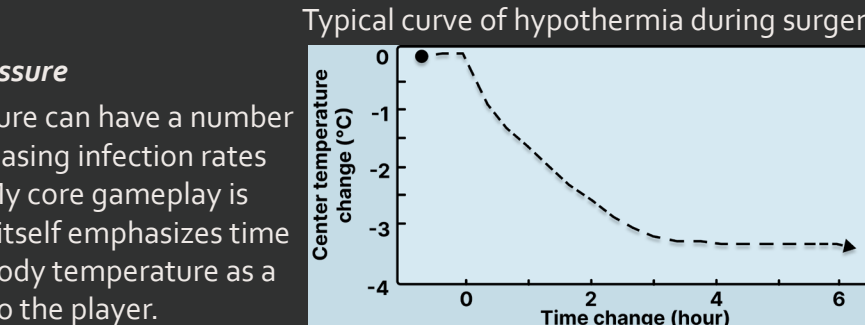
Wooden Structure and Organ Specimen Iteration

From Paper Box to Acrylic Sheet

In the previous iterations of the MakeyMakey project, I had this optimization idea, but due to the limited project timeline at the time, I couldn't attempt it. So, this time, I tried the feasibility of this approach myself.


1. Paper boxes are relatively fragile. I iterated them into multiple superimposed acrylic sheets. The advantage of this is that it provides a consistent visual appearance, similar to organ tissue slices. It is not easily damaged, and it also has a high level of aesthetics, making it suitable for display.
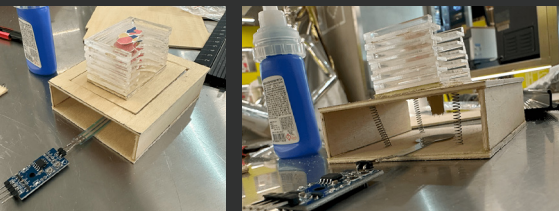

2. After successfully creating this component, it also serves an educational purpose. It helps players understand organ structure."
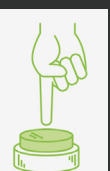
First Structure Design & Testing

Conceptual Drawing
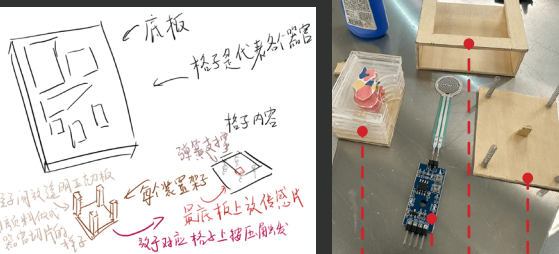
1. Layered heart organ
2. Pressure sensing sensor
3. Load-bearing area casing
4. Spring-supported load-bearing platform


Assembly Forming Structure Diagram

Initially, the structure I designed treats the organ specimen as a button. When the specimen is pressed, the base platform will depress, and then a protruding column in the center of the base's bottom surface will make contact with the sensing area of the pressure-sensitive sensor below.
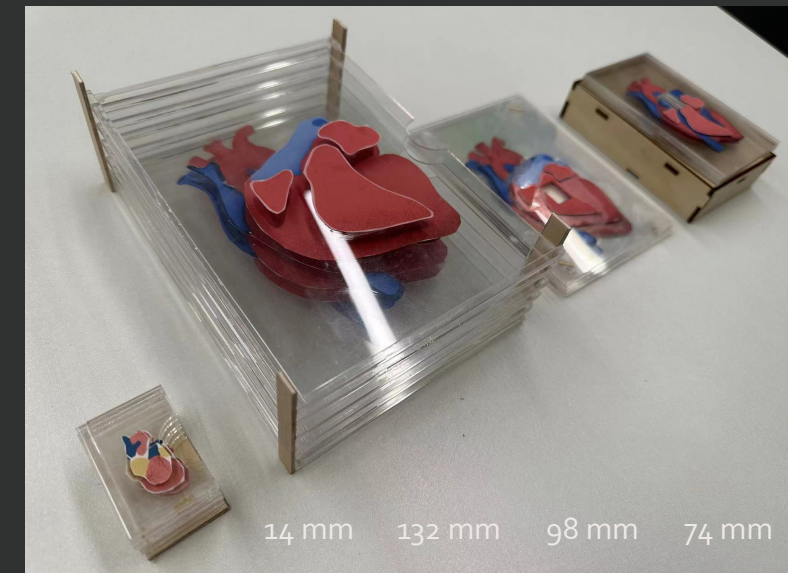
Second Design & Testing

What's different from the first test is that I adjusted the size proportion of the heart to be consistent with the actual heart size, and as a result, I scaled up the entire base proportionally as well.
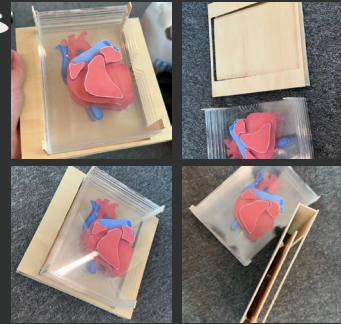
In addition, based on the feedback from the first version, I designed the base to have a certain degree of internal depression in its default state, in order to align the specimen's position with the inner grid of the casing and prevent displacement.

Third Design & Testing

In the second round of testing, it was observed that when the specimen is too large, the required force for pressing it as a button becomes excessive, and a lighter touch is preferable for a better feel.

Additionally, I made some adjustments to the spacing between the slices to test the visual effect and spatial perspective.

Final Version

14 mm   132 mm   98 mm   74 mm

Final Physical Structure Production Process

Laser Engraving Blueprint Iteration and Form Establishment – Ver 1

At first, it was done in a one-to-one human body scale, but in the end, it was found that due to the expansion of the specimen's outer frame, it wasted a lot of cavity space.
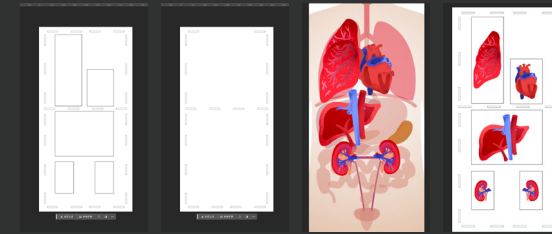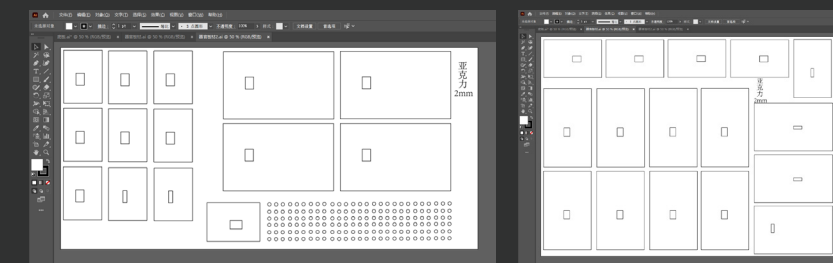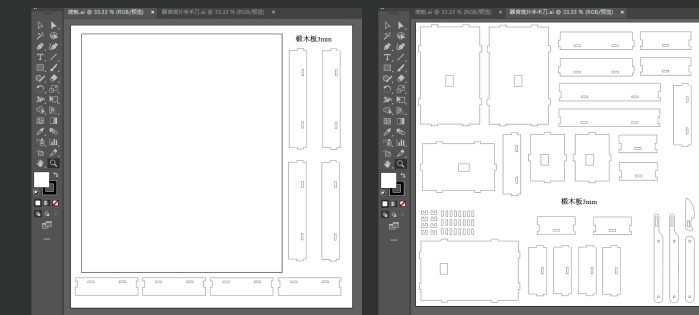
Additionally, the heart and the two lungs have overlapping relationships, and when laid flat, the combined width exceeded the bounds, making it impossible to fit all the organs in.

Initial Concept

Scalpel Design & Production

Initial Concept: Design surgical knives as keys, a total of 4 surgical knives, with unique blade shapes, each of which can only be used on specific organs.

However, upon careful consideration later on, given that the core gaming experience involves Quick Time Events (QTE) with a fast-paced rhythm, introducing the need to find keys and making the organ locks too small or specific could easily disrupt the gameplay experience.

Laser Engraving Blueprint Iteration and Form Establishment – Ver 2

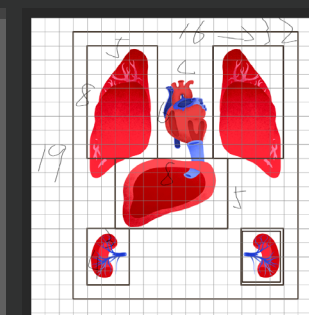Acrylic Sheet Cutting Blueprint

In the end, I abandoned the initial idea of creating a complete one-to-one representation of the human body's interior. I removed the intestinal space and, to some extent, reduced the size proportion of the internal organs.

1. Heart (Width 7.4cm - Height 11.4cm)
2. Liver (Width 9.4cm - Height 15.4cm)
3. Lungs. Left and Right (Width 9.4cm - Height 15.4cm)
4. Kidneys. Left and Right (Width 5.4cm - Height 7.4cm)
5. Load-bearing Wooden Base (Width 32cm - Height 38cm)
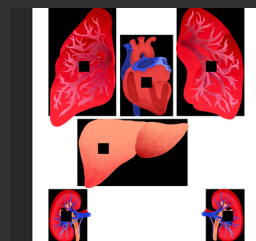

Basswood Board Cutting Blueprint

Aspect Ratio

Scalpel Poke Opening Position Illustration

Basswood Board Finished Product

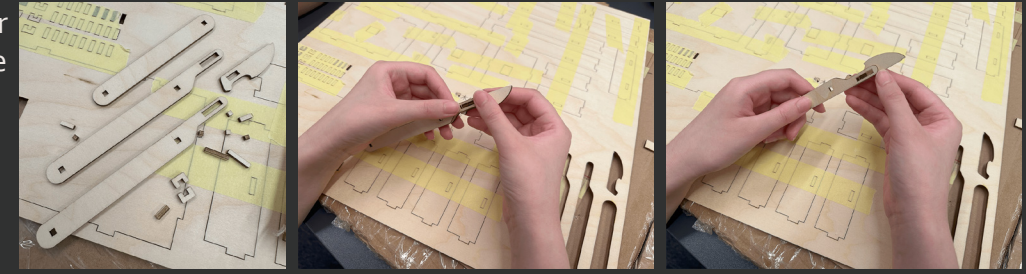Acrylic Sheet Finished Product

Production

Establishment of Game Art Style and Structural Information Research

Exploration of Organ Internal Structure

Because I have no medical background, in the part of obtaining information about organ cross-sections, I tried various methods to find reference cases.
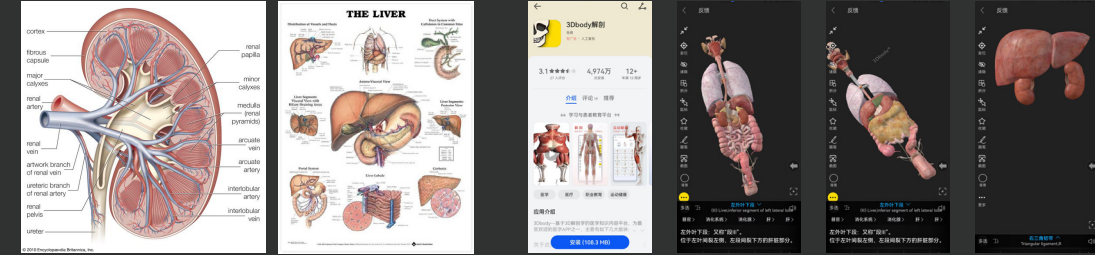
Online Research-Derived Visual Reference Examples

Used the "3D Body Anatomy" mobile app for observation

Played VR game Human Anatomy VR for observation

Bought pig liver and pig lungs from the market, brought them home, and sliced them for observation

Art Style

Several Early Attempts at Art Styles

Learned Nick Nazzaro's art style, with a particular focus on the use of shading

Final

	HR	ST	I 0.1	
	160		II 0.1	58
	40		III 0.0	

SpO2	Adult	98%
100		
85	5.00%	

| NIBP | (93) |
| 120/80 | |

| TEMP | 37.1 | 38.0 |
| | | 36.0 |

| NIBP | (93) |
| 120/80 | |
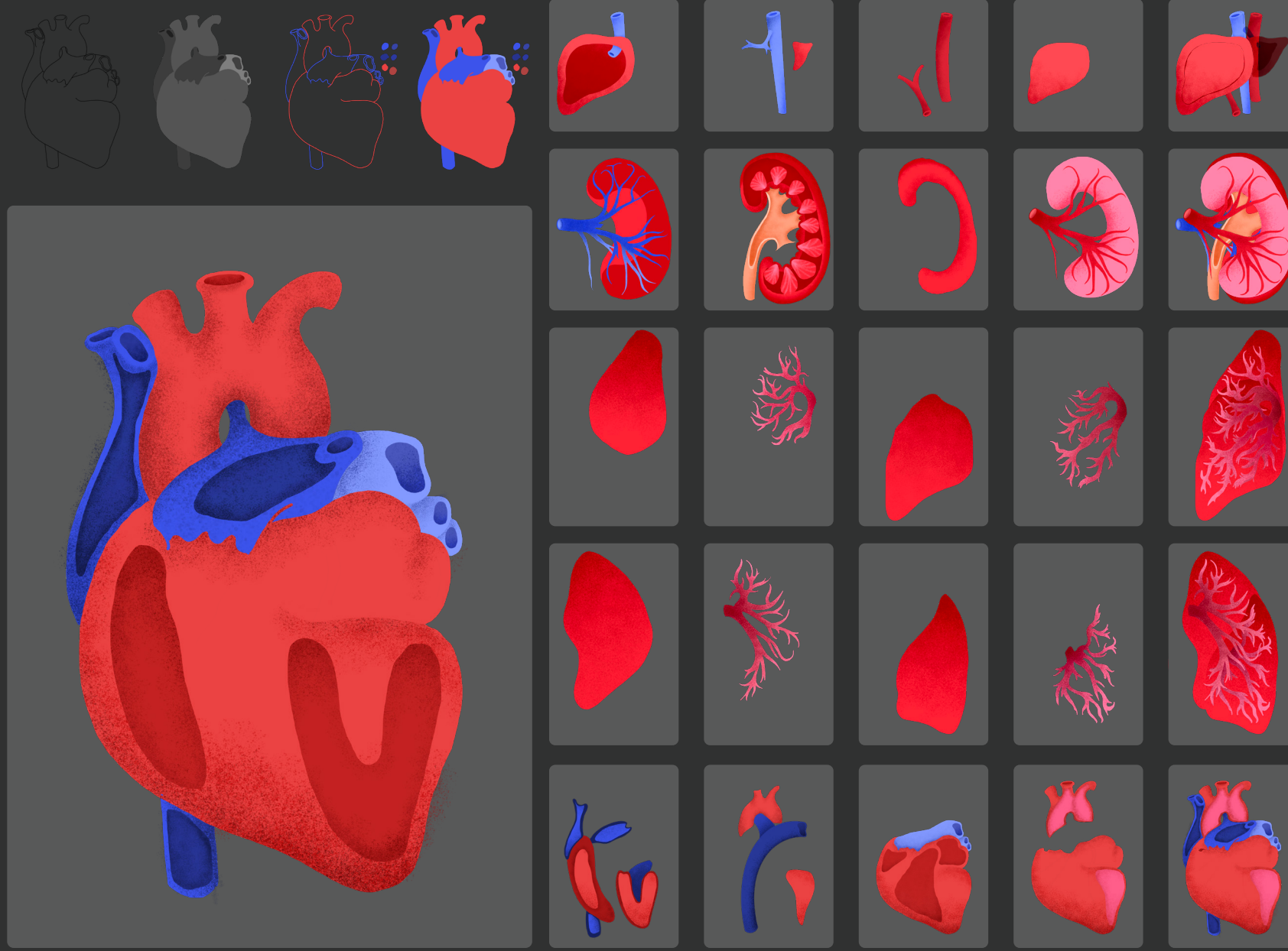
RUN TOY RUN

Thesis Proposal!

Game Genre:
Puzzle, Environmental Exploration, Escape

Target Audience:
Anyone who is filled with childlike wonder, someone who is reminiscent of the imaginative thoughts of their childhood.

Inspiration:
Toy Story, It takes two, Lego Toys

Experience:
Hoping to deliver an exhilarating and thrilling escape adventure, allowing players to experience the joy reminiscent of childhood games of make-believe along the way.

Inspiration

My inspiration comes from childhood fantasies in my bedroom, such as monsters under the bed, sleep paralysis, the toys' own world and stories, or the idea that furniture and chess pieces come to life when I'm not around.

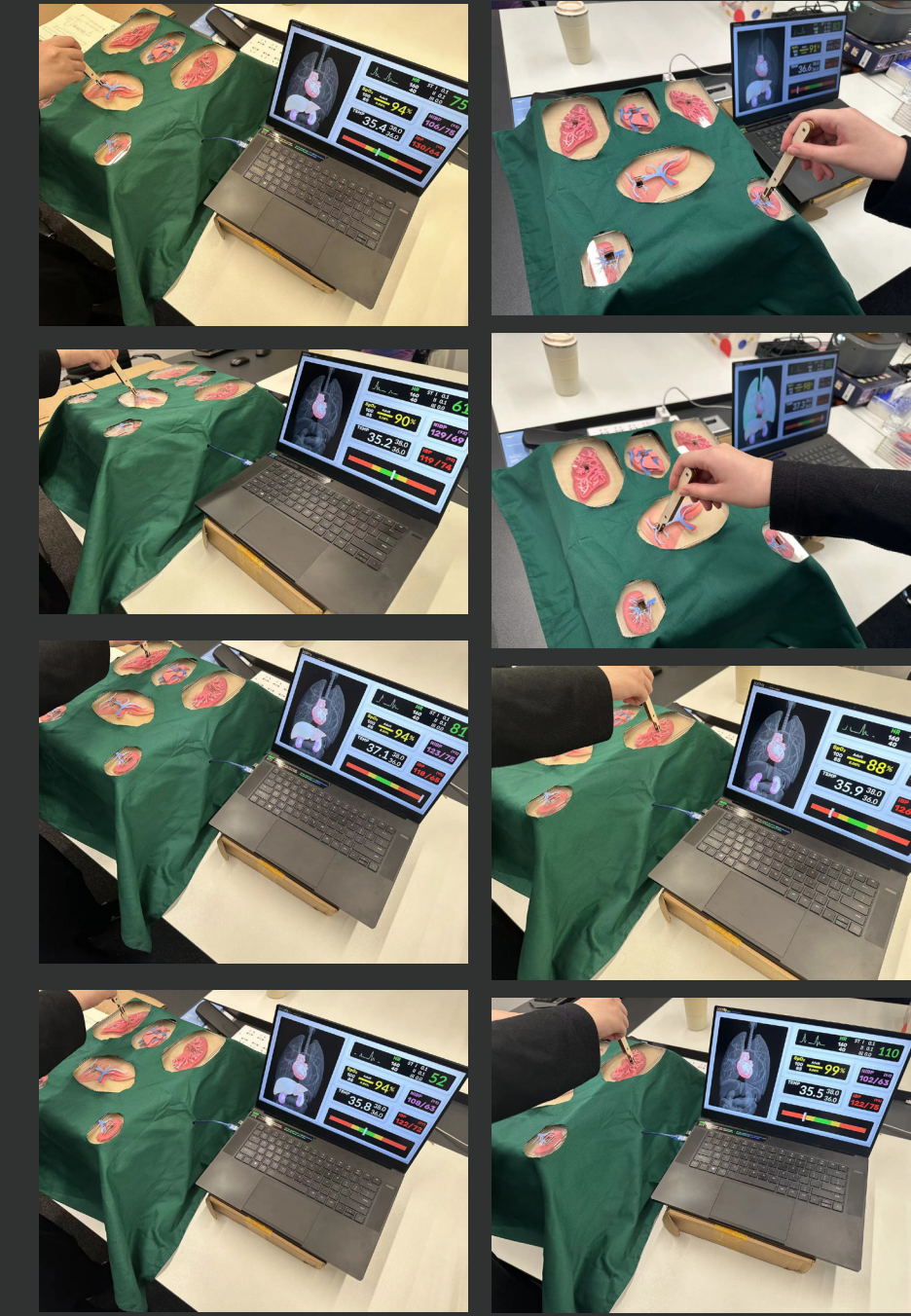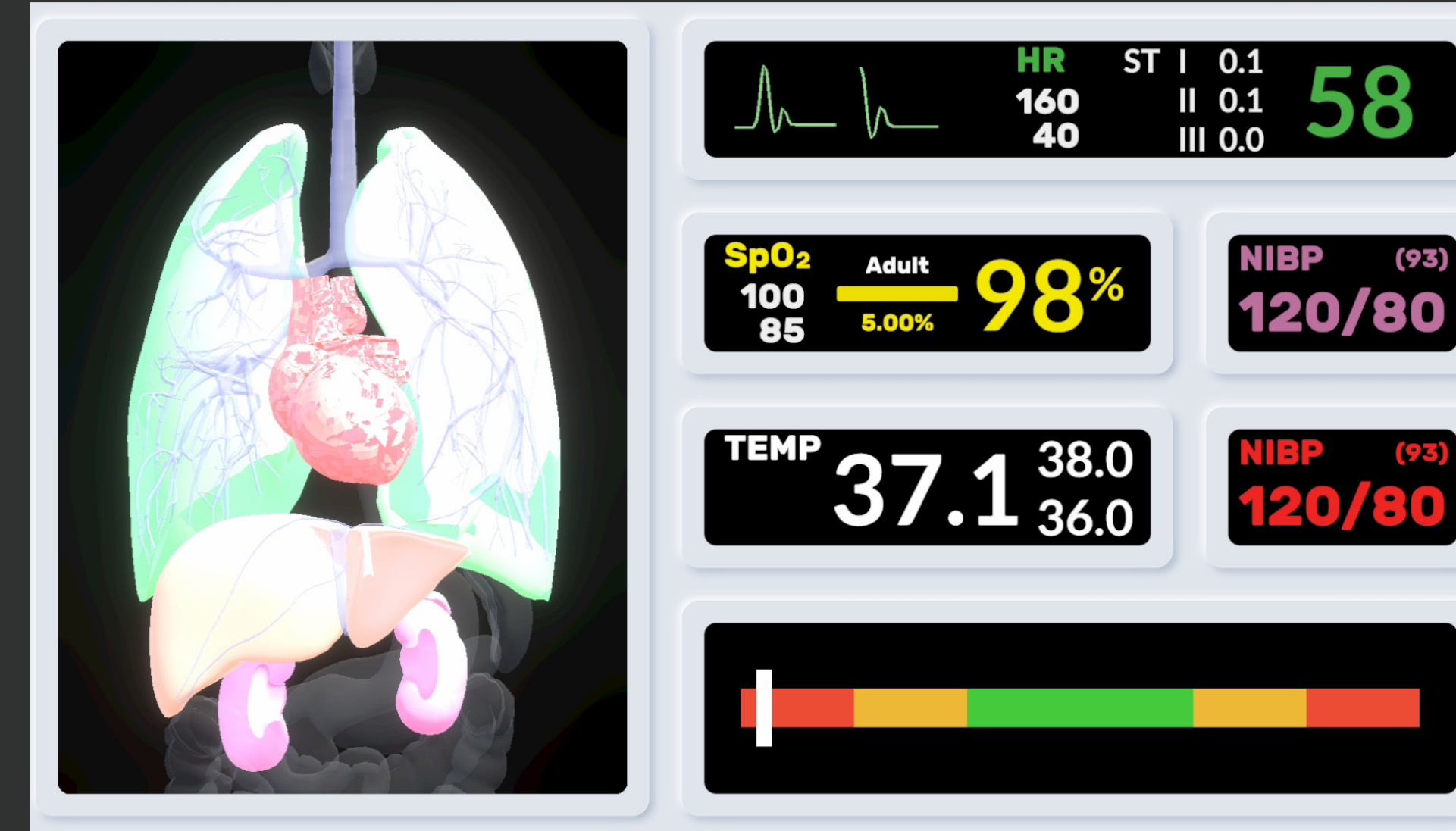Clearly, I enjoy "Toy Story" and "It Takes Two," and I'm looking for similar stories and narrative atmospheres, but I want to discover a gaming style that's more unique to me.

Since I've drawn inspiration from "Toy Story" and "It Takes Two," I decided to start with the most familiar place - my own bedroom. I want to experiment with merging ideas from both sides and create a story where the protagonist in the bedroom shrinks to toy size.

During the brainstorming phase, I sketched some rough sketches to help me better define the visual direction I wanted for the game.
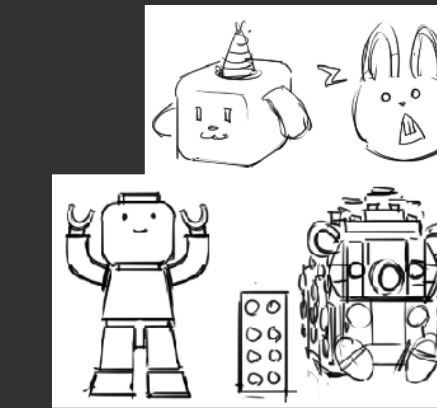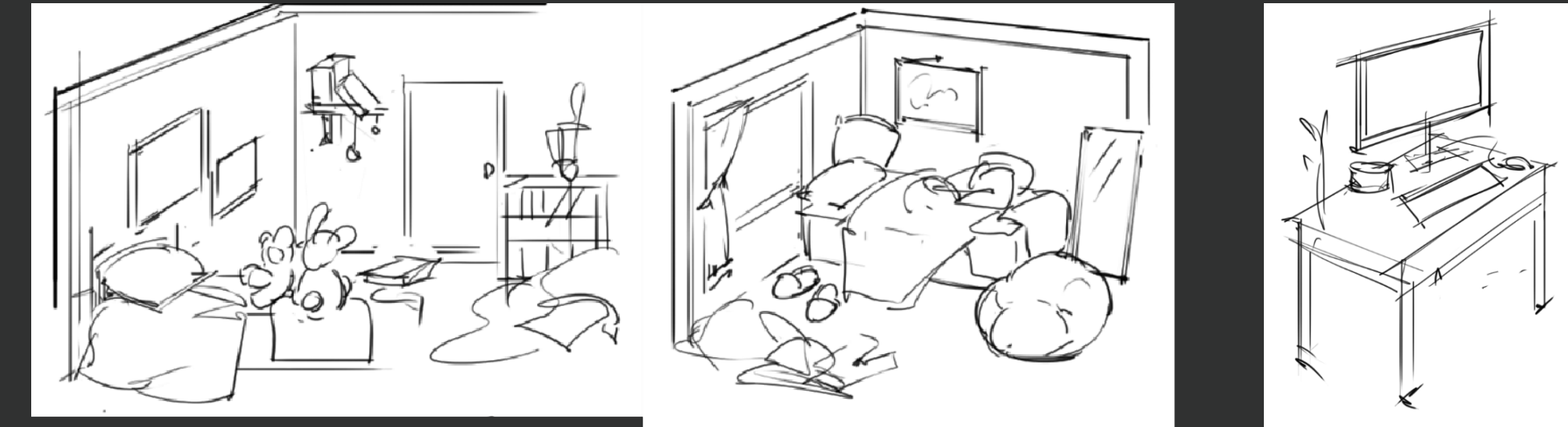
Research

Before finalizing the specific gameplay design, I conducted research on information related to puzzle games, environmental narrative games, and level escape games, obtaining the following data.

Gender Ratio Survey for Puzzle Game Players

66% of puzzle players in Japan are women, and 73% in South Korea. In the US, 75% of matching puzzle and word/brain/board players are women. In the UK, 74% of puzzle players are women.

In general, there are more female players who play puzzle games, accounting for 75%.

Reasons for Playing Puzzle Games

- Relieving stress: 48% / 35%
- Passing time: 45% / 55%
- Feeling accomplished for completing something challenging: 31% / 29%
- Immersing myself in another character/world: 31% / 17%
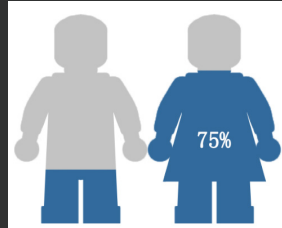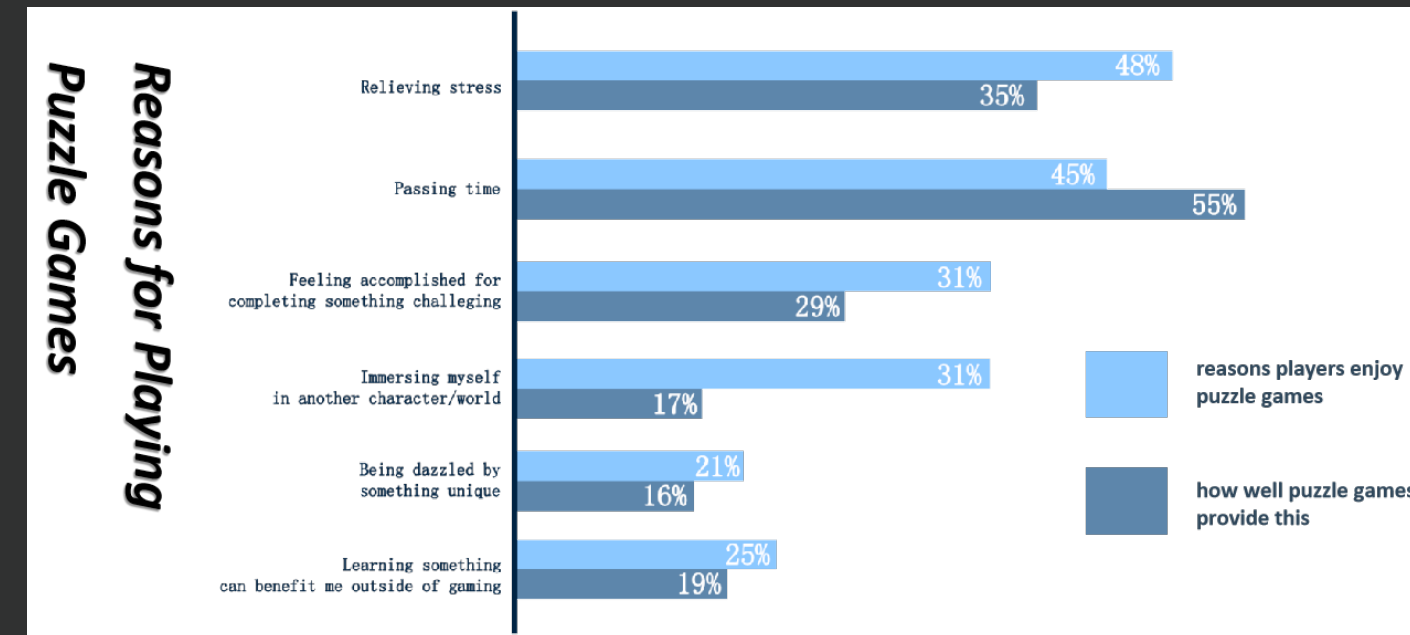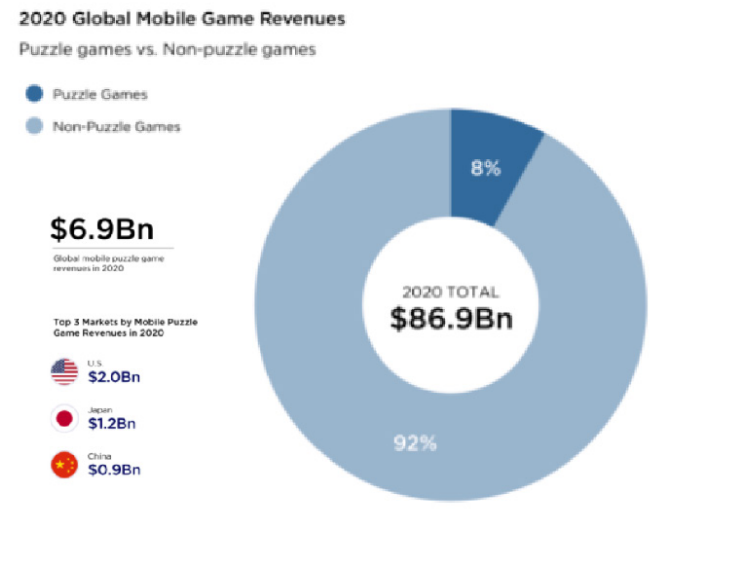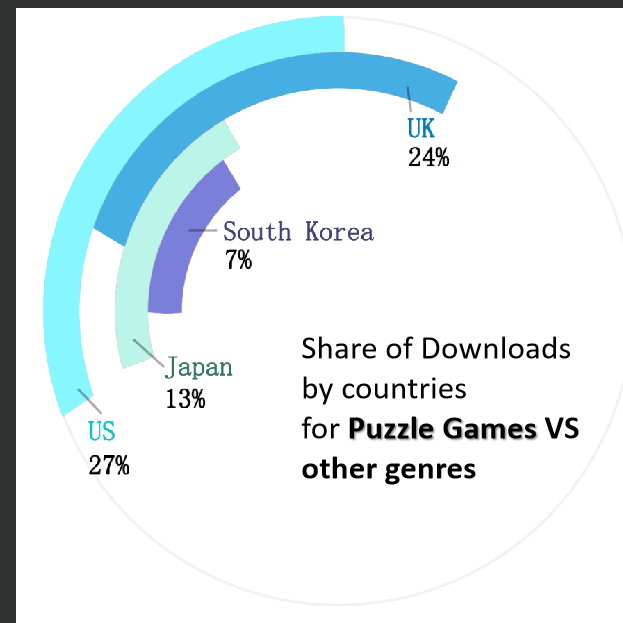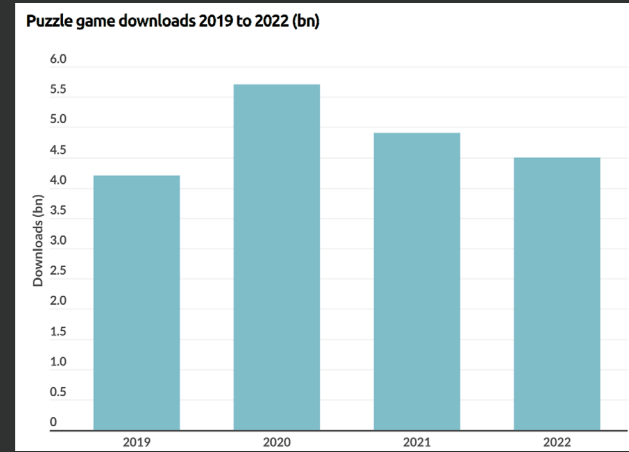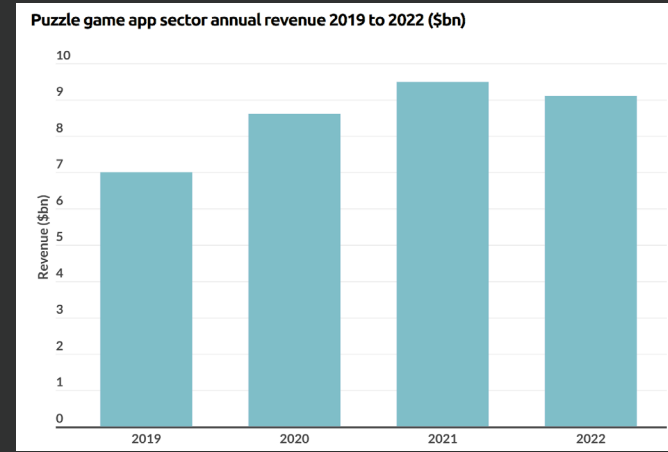- Being dazzled by something unique: 21% / 16%
- Learning something can benefit me outside of gaming: 25% / 19%

reasons players enjoy puzzle games

how well puzzle games provide this

From the data on the right and the surveys, it can be seen that puzzle games have a very good market both on mobile and PC platforms, with a wide range of users. Compared to other types of games, they also have significant advantages in terms of profitability.

Puzzle game app sector annual revenue 2019 to 2022 ($bn)

Puzzle game downloads 2019 to 2022 (bn)

Share of Downloads by countries for **Puzzle Games VS other genres**

- UK 24%
- South Korea 7%
- Japan 13%
- US 27%

2020 Global Mobile Game Revenues
Puzzle games vs. Non-puzzle games

- Puzzle Games
- Non-Puzzle Games

$6.9Bn

2020 TOTAL $86.9Bn
8% / 92%

Key Puzzle Game Statistics

Total revenue from puzzle games was $9.1 billion in 2022, a decrease from $9.5 billion the previous year
The number of downloads of puzzle games has fallen from a pandemic peak of 5.7 billion in 2020 to 4.5 billion in 2022
Candy Crush dominates the sub-sector with 255 million users in 2021 and $1 billion in revenue last year

Ideation

When I confirmed that I wanted to make an environment exploration game limited to a bedroom environment, I first started with a floor plan and tried different directions. I also combined it with more photo reference images to clarify the elements that needed to appear in the scene.
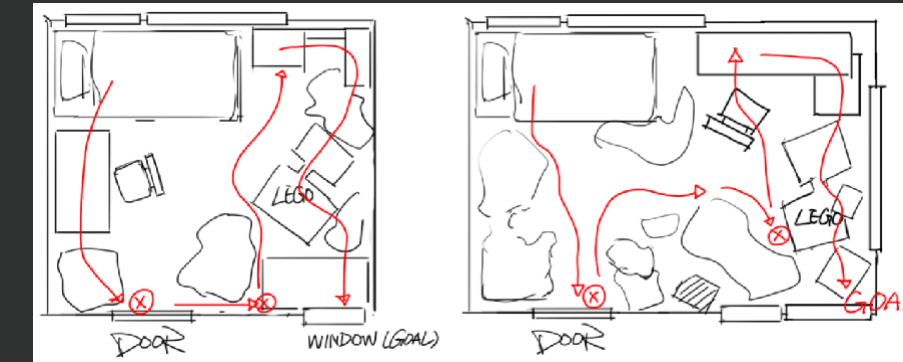
In the end, I decided to make a smaller, more cramped bedroom map to highlight the cluttered feeling of the entire environment. At the same time, I also started to think about more specific gameplay.
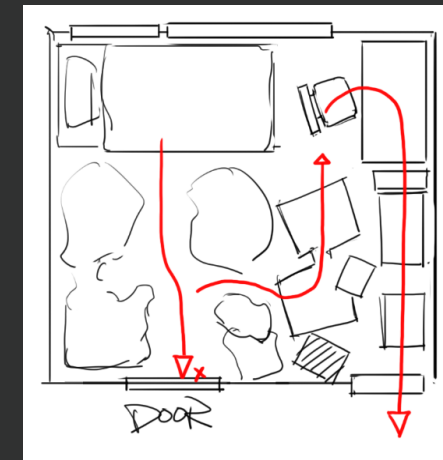
More specific prop references in the bedroom

Bed reference, but when I actually made it, I wanted it to be a little more messy.
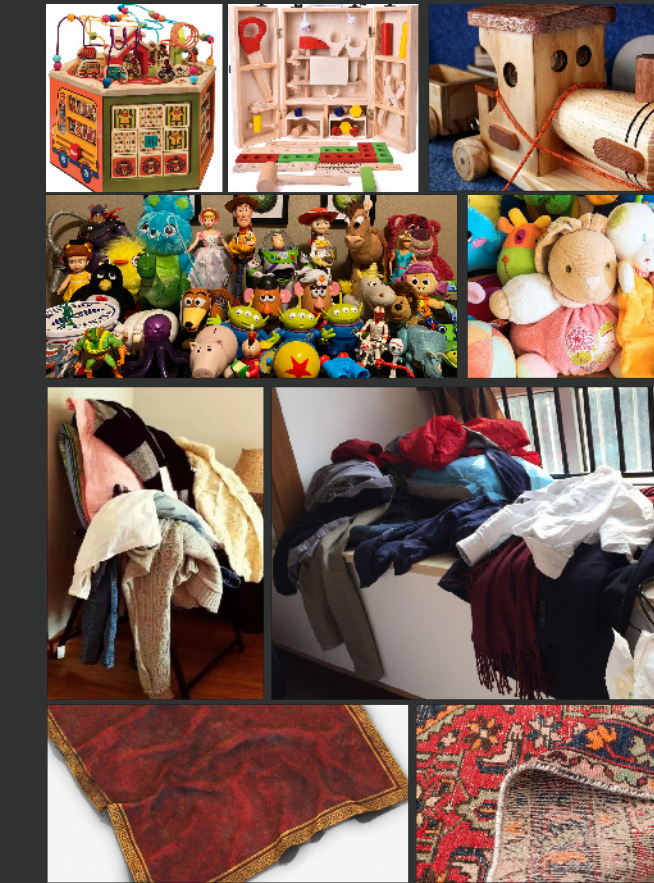
References include toys, room clothing, carpets, etc. At this stage, I was thinking about what kind of art style I wanted to use as the final game style.

I also use sketch to establish the proportional relationship, which will be clarified in subsequent 3D production.

Player size

Character Features

I initially wanted to imitate the enemy design like Pic-man, but found that it was too difficult in such terrain, so I changed it to a watchtower style like the one shown below.

Art Reference

Based on the idea of lego toys, I finally decided to make lowpoly style.

Gameplay

Taking over the previous idea of making the protagonist the size of a toy figure, I roughly thought about some early gameplay directions, and polished one of them thru my sketches.

Player becomes toy size.

Players find that after becoming smaller, they cannot go to many high places.

Players begin to explore around and find paths to climb to higher places.

While avoiding the scanning of enemies at high places, you can understand the terrain and find the exit to escape.

Player escapes.

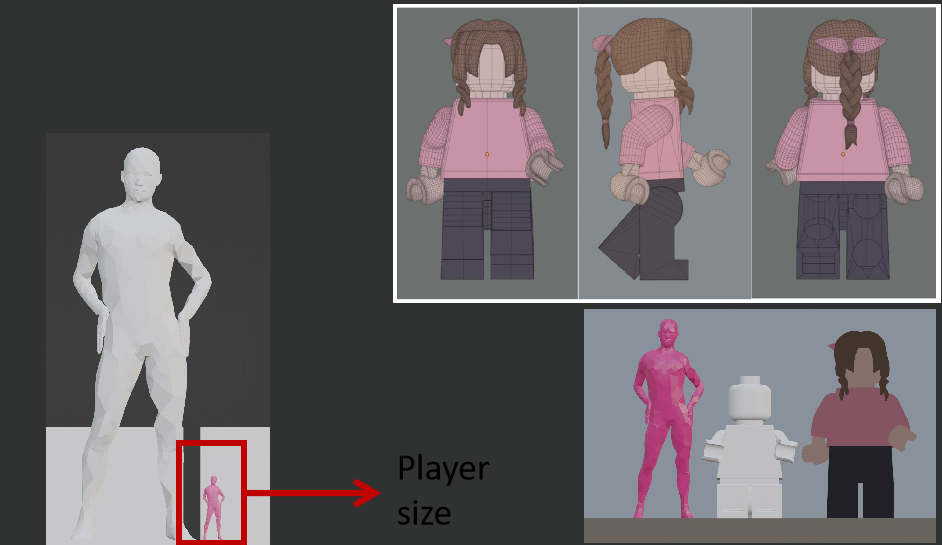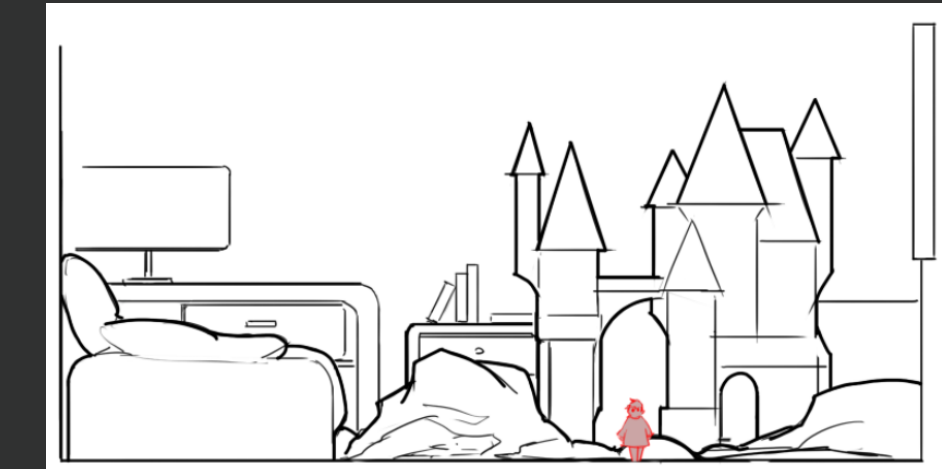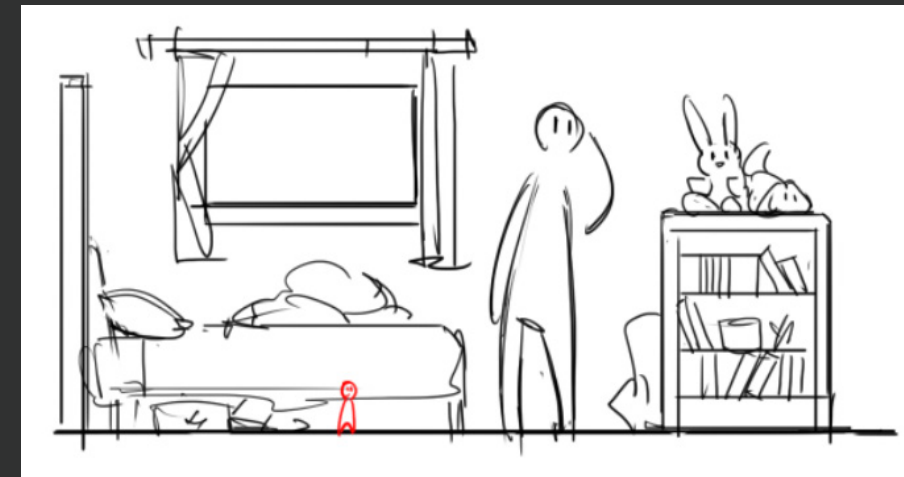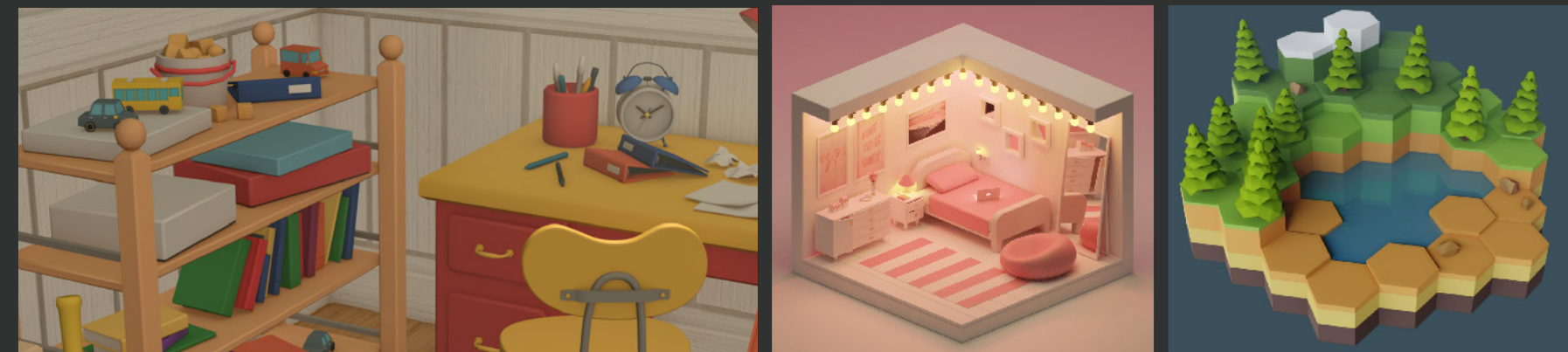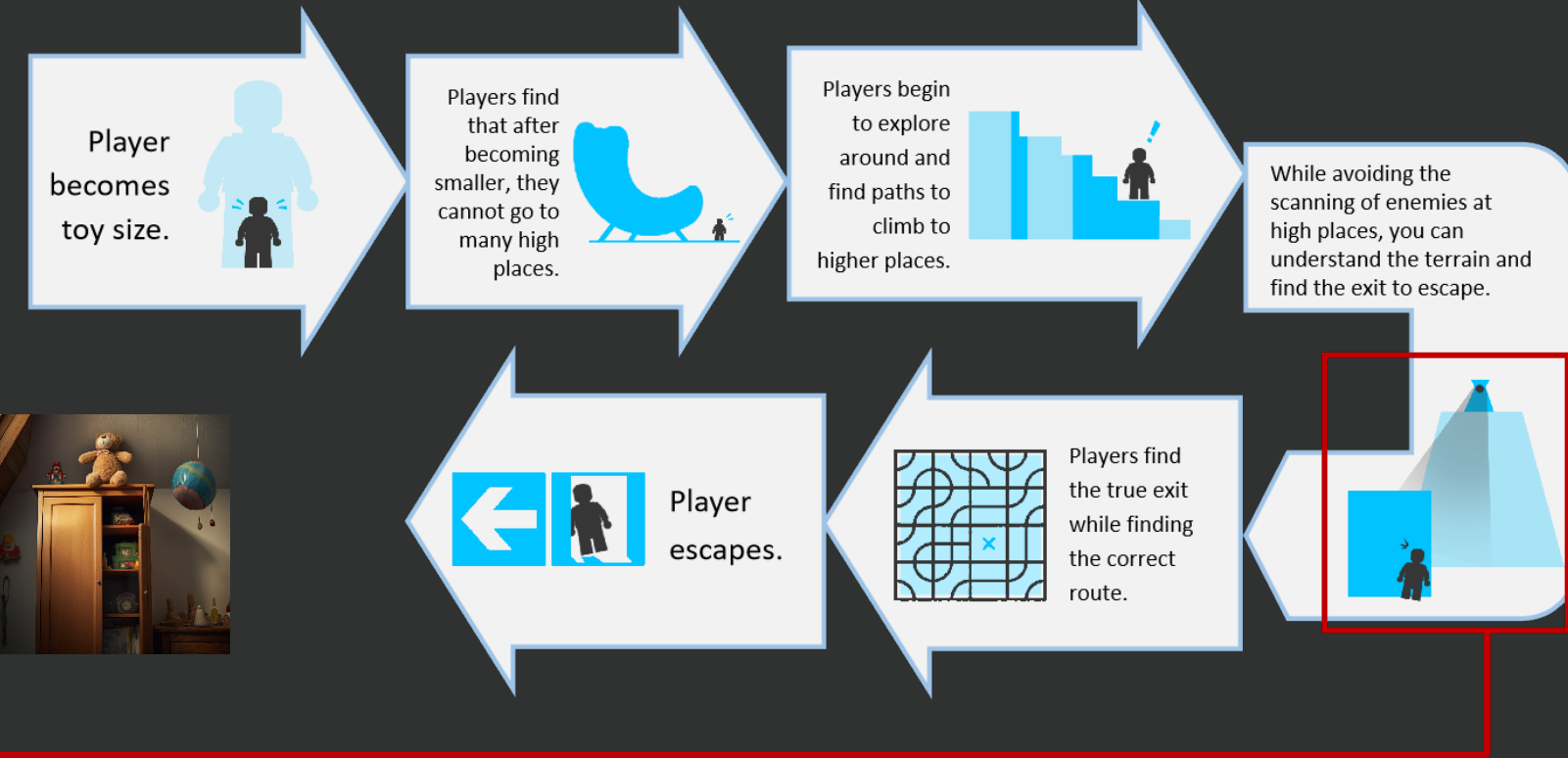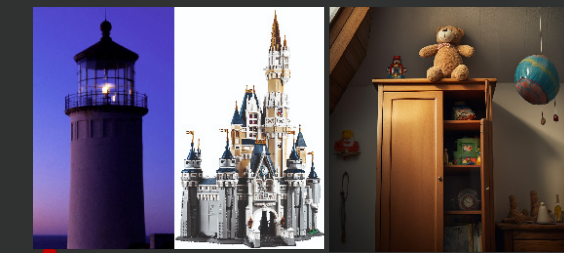**Players find the true exit while finding the correct route.**

Narrative Performance

After I briefly completed the script, I also made a rough draft of what was needed.

The player starts out with a strong force grabbing him in the palm of his hand and throwing him under the bed. (There are some scattered puzzle pieces and buttons under the bed.) You find that everything around you has become larger, and you find that you are about the same size as him. (Or there is a small plastic toy man lying next to you, and you find that you are about the same size as him. (Or there is a glass bottle under the bed, the player can look in the mirror)
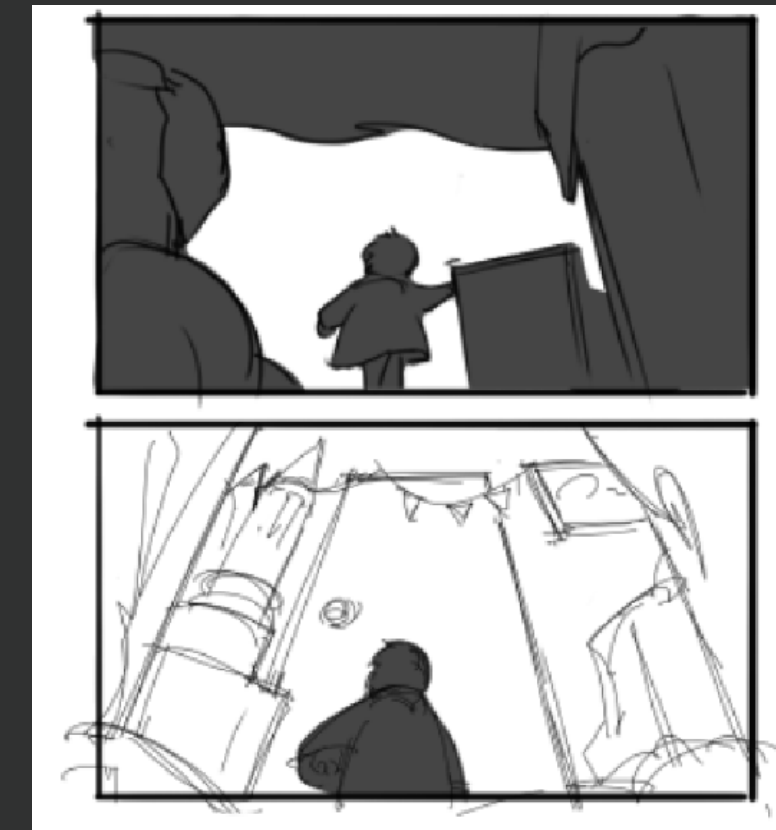
Both sides of the bed were against the wall, and one side was blocked by debris. You can only walk towards the only place with light ahead.

Going under the bed, the floor has lots of carpet. Your family is not allowed to enter your room, so you have to clean up everything in it yourself (messy). Carpets and blankets are spread randomly on the floor. You also like to throw clothes around. Now for you, these former piles of clothes , are all hills. Bad habits in the past have accidentally caused you to have difficulty walking now. You look at the gate not far away and feel like you can escape from this place. When I actually arrived, I found that I couldn't open the door at all.

You groped in the pile of clothes and removed a sock. You found a passage that led to the Lego castle you built with your own hands. However, the castle looked dark and was not a very good shelter. , but you can only bite the bullet and walk in.

The debris piled up on the bed used to look like a ghost in the dark, but now it really is a ghost sitting upright, with his eyes emitting red searchlights, looking for something. If the player is caught by the searchlight, he will Directly trigger the animation of the ghost on the bed flying over and chasing you, then end.

Sketch & Modeling

The scale relationship is the most challenging aspect of this scene design because I want players to freely find objects to climb and explore in the scene, while also maintaining the normal scale of most furniture to emphasize the experience of the protagonist shrinking and adventuring in real space.

The same issue applies to other furniture as well.

By validating the proportions of the level and character scenes in UE4, the final design of the entire level is completed. Afterwards, returning to Blender, based on the proportions and standards, the production of 3D art assets begins.

Obstacles that can be climbed to the top with some effort

Possible exits

Lookout tower enemies, must not be seen by them

Character

Piled-up clothing and fabric, can be used as hiding and cover, also climbable

Based on the preliminary flat sketches, I've created a basic 3D model and tested the feasibility of the entire level in UE. Ultimately, I've decided to go with the design scheme on the right.

3D Development

When I finish the model production, the next challenge is the materials. The low-poly style requires simple and clear textures, but achieving lighting and glowing effects has proven more challenging than I initially thought.

To balance the distinction between weakly glowing and decorative objects that can serve as light sources, I choose to employ different methods in creating glowing materials.
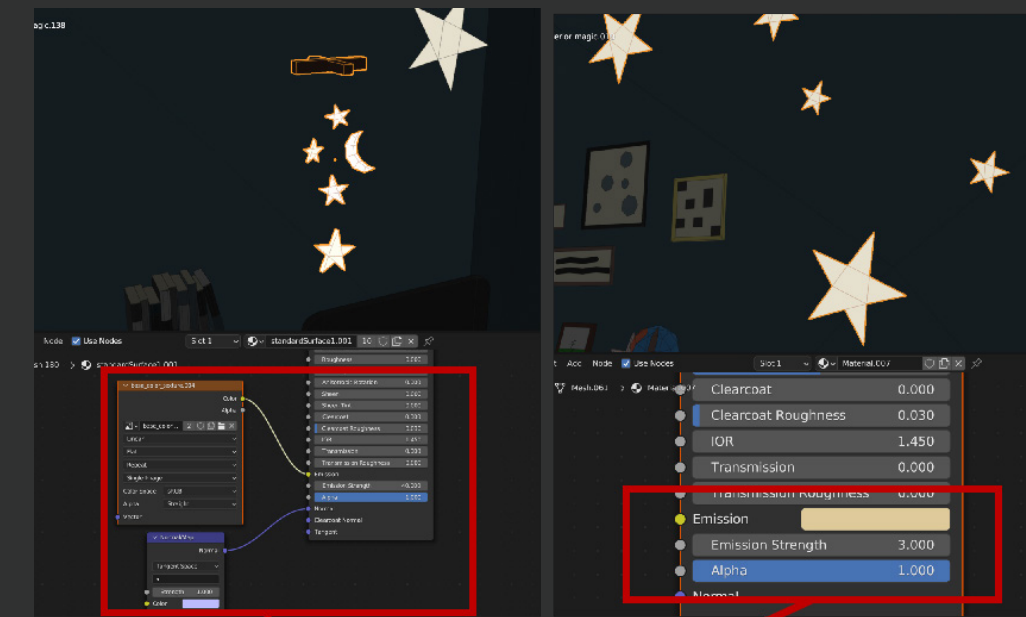
Handling glowing materials in different ways.

large field of view

half view of the body

Type	Perspective
Field of View	102°
Lens Unit	Field of View
Shift X	0.000
Y	0.000
Clip Start	0.1 m
End	1000 m

Managing the camera perspective was another time-consuming aspect. I experimented with various approaches regarding whether to reveal the entire body of the protagonist in the player's view and the size and distance of the focal point. In the interest of narrative service, I ultimately decided to show the full body of the protagonist, with a slightly upward perspective, emphasizing the towering nature of the surrounding objects.

Start Point - Under bed

Explore the room

Catched by the ghost

Production Plan

TIME	DAY 10	DAY 20	DAY 30	DAY 40	DAY ???

PHRASE

Prototype
The planner or main producer and project initiator complete the basic game functions and interactive development. To clarify the gameplay and mechanics of the game and complete prototype development, it is necessary to complete the verification of the gameplay mechanism and the verification of basic functions (somewhat similar to early tech demos).

Prototype Review
Review prototype, clarify the core mechanism, gameplay, and interaction, break down the technology, art, planning and development needs and various directions, and establish the size of the demos. Optimize gameplay and mechanics. The demo workload of technology, art, and planning (game content) has been divided into standards for each part.

Demo
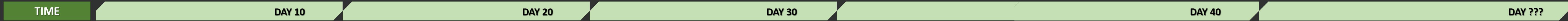A small amount of art, technology, planning, sound effects team, etc., based on the verified gameplay, completed the demo (part of the completed chapter process, a certain degree of game content, and a relatively complete display of the game mechanics), striving to be consistent with the final game effect. . Various departments collaborate to develop and complete each part of the work. Adjust and optimize in the middle, and constantly detail the effect of the final product.

Testing & Review
Conduct small-scale evaluation of the Demo by internal staff or external players, friends, etc. Debug, optimize, correct, etc. based on feedback and testing, etc. At this stage, it is also necessary to establish the docking methods and standards for all aspects of development and processes in subsequent Production. Optimize and complete debugging.

Production
Based on established development standards, the tasks are divided, and each department completes its assigned responsibilities. Management and planning personnel are responsible for quality assessment, coordination, time planning, and other related tasks.

QnA
For each stage and version, acceptance and optimization of the development content will be conducted. Player and internal playtesting data will also be collected within a certain scope for modification and improvement. This process will persist throughout the Production stage and continue until the entire lifecycle of the game concludes.

Pre-launch+Launch+Post-launch,+Post-production
The core content of the game has been fully completed in this stage, and more extensive testing will be carried out progressively. The testing in this stage is mainly focused on debugging and balancing adjustments. Major modifications to the game mechanics and gameplay are unlikely at this point. Another crucial aspect of this stage is collaboration with the marketing team to handle promotion, advertising materials, and related promotional activities.

Based on community feedback, we will continue to optimize and address bugs through patch updates. Simultaneously, there is the possibility of developing downloadable content (DLC), which follows a process similar to the early production stage.

DEPARTMENT &MEMBERS

DESIGN: Gameplay, Mechanics, Level Design	DESIGN: QnA, Test, UX	ART: Art Style: UI Environment Character, Animation, Effects	DESIGN: Gameplay, Mechanics, Contents, Level Design, Character Design	ART: 2D Art, 3D Art, Art Assets, Animation, Effects	DESIGN: QnA, Test, Project Bible, Pipeline
TECH: Function, Features, Engine	TECH: Test, Debug	OTHERS: Audio effects, Management etc.	TECH: Function, Features, TA, Engine	OTHERS: Audio effects, Management, Marketing etc.	TECH: Test, Debug, Development log, Pipeline

ART: QnA, Test, Art Bible, Pipeline	DESIGN: Gameplay, Mechanics, Contents	ART: 2D Art, 3D Art, Art Assets, Animation, Effects	DESIGN: QnA, Test ,	ART: QnA, Test,
OTHERS: Test, Pipeline, Marketing etc.	TECH: Function, Features, TA, Engine	OTHERS: Audio effects, Management, Marketing etc.	TECH: Test, Debug, Development log	OTHERS: Test, Pipeline, Marketing etc.

Here, in addition to the previous development departments, there will also be external market and sales departments, and even channel and platform partners joining in.