



Game Development Guide

Steamwell

Cogs in the Machine Studios

Team 5

Executive Summary

High Concept

You used to be part of the company SteamWell, but after attempting to steal their proprietary water-compressing technology, you lost half the Earth's water. In this 3D puzzle narrative, break into the abandoned factory, solve puzzles, avoid enemies, and try to fix your mistake.

Core Gameplay: Mechanics and Planned Dynamics

Mechanics

- Avoid Enemies
 - Throw Objects and make noise in order to distract the Guard Bots, opening a moment for you to pass
 - Avoid being seen by staying out of their line of sight and crouching behind objects when needed
- Unique Level Mechanics
 - Level 1 - The Mail Room: Move bookshelves within the Company archives to reveal a cog. Some may not have a cog behind them, some may block your path, find the correct way to move the bookshelves to find all cogs without being detected by patrolling guards.
 - Level 2 - Control Room - Utilize 3 cranks across the room in order to align the pipes to access the Heart of Steam. Do this all while avoiding the Automata's vision.
 - Level 3 - The Heart of Steamwell - The final stand between the boss, Manager Automata, complete the culmination previous mechanics in order to disable the boss and return water to the factory.

Planned Dynamics

Use movable objects to break your way into SteamWell but be wary of the patrolling guards. Pick up scrap to throw in their direction, causing a distraction and allowing you to run past. Encounter unique puzzle rooms within the company building that you must solve to continue the story.

Core Gameplay Aimed Aesthetic

Tense; Strategic

Challenge occurs when players have a puzzle that must be completed but without being detected by guards which will require strategic timing and trial and error as they get a feel for the current puzzle.

Look, Feel, and Sound Aimed Aesthetic

Artstyle - Low Poly; Steampunk

Play Aesthetics - Gloomy; Dark

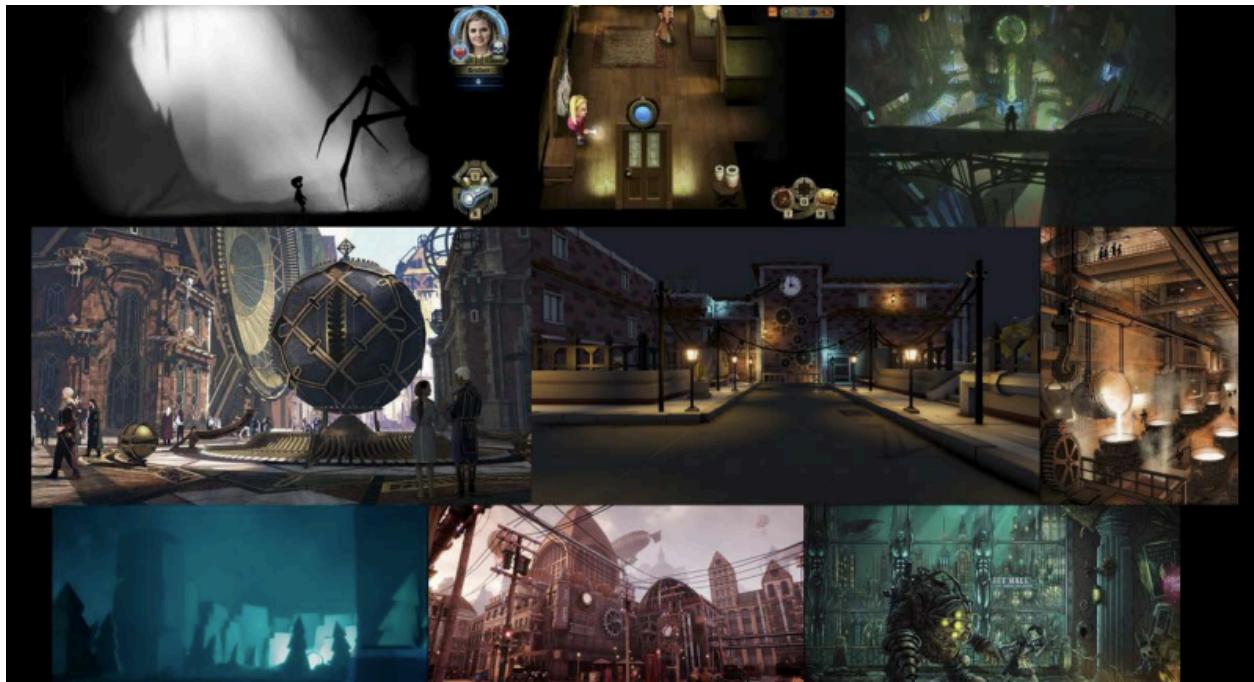


Figure 1: Mood Board 1 – Shows a dark steampunk aesthetic and feel of the game.



Figure 2: Mood Board 2 - Shows a dark steampunk aesthetic and feel of the game with the addition of color palettes for environment and art.

The game takes place in a Steam Factory located in a desolate wasteland so we want to convey an ominous and gloomy feeling to the world. This is done with muted colors, darker palettes and a sound aesthetic listed below.

Music: Industrial Dark Ambience

Prominent sounds

- Steam
- Machinery
- Metal clanks
- Water
- Robotic movement/noises
- Gears grinding

Genre, Platform, and ESRB

ESRB - T for Teen

Platforms

- Windows
- MAC OS
- Web
- VR (Challenge Build)

The listed platforms were chosen due to their popularity and easy access for consumers. Most players will access the game on a PC or laptop while VR is a popular option for alternative play experiences.

Audience and Targeted Customers

Target Audience - Casual Puzzle and Story Players

Target Player Persona - The Architect (INTJ Personality)

- Enjoys
 - Strategy
 - Problem solving
 - Learning
- Dislikes
 - Inefficiency
 - Chaos
 - Deception

Similar Games

- Epic Mickey
- Little Nightmares
- Machinarium
- House of Anubis
- Resident

Game Differentiators/Unique Selling Points

- Extensive worldbuilding and lore to discover
- Unique puzzle mechanics
- Visual Aesthetics

Current Status, Timeline, Technology, and Costs

Current Status: Game Concept Phase

Costs

7 Members x \$50.00 rate x 12 hours Avg. x 15 = \$63,000 Total Costs

Technologies Utilized

- Unreal Engine - Game Engine
- Premiere Pro - Video and Sound Editing
- Blender - 3D modeling

- Gitlab - Repository and Version Control
- Trello - Task Management
- Procreate - Concept Art
- Photoshop - Concept Art

Signatures verifying agreement:

Atilla Istami

Edward Ramon

Joy Ekechukwu

Lila Mali

Maxmillion Maldonado

Patrice Hayes

Stephan Ozan

The Team

Our mission is to collaboratively create an interesting, complete, and high-quality gaming experience. We aim to utilize the talents of our teammates to streamline the game development process and create the best product possible. The culture of the development process must prioritize respect, honest feedback, creativity, and inclusivity. We have collective ownership over all aspects of development, and can always go to each other for help and provide ideas on any part of the game. The combination of fostering a healthy team culture and a commitment to our mission puts all members in the ideal position to create a great game and, most importantly, have fun. See Appendix for details.

Overall Game Design

This section describes the overall design of the game.

Game Aesthetic

- What does the world look like?

The world is Steampunk, specifically apocalyptic, automated, industrial. The game takes place in a massive factory for one of the key companies in this fictional universe. It is grand, so the character interacts with things on a grand scale: bookshelves three times their size, pipes, etc. The play spaces will also incorporate a sense of grandeur, with atmospherics as the factory towers above.

- What sort of feelings is the game trying to evoke in the player?

The game tries to isolate the player, but there is information to search for that builds a picture of the world. Water is lost, but advanced technology exists and is still running within this otherwise abandoned factory, in this case, alienation. However, another feeling the game strives to create is

Character's Story Synopsis

Character - Motivations & World Influences

Abilities- The character uses modern technology primarily to manipulate objects much larger than them.

Our character, Christain Vance, was once the spokesperson for SteamWell, however, after being paid an exorbitant amount by another company to steal SteamWell's water compression technology, they lost half of the Earth's water. Whilst attempting to steal the technology, they were unaware that what they'd taken held the Earth's water, and the few capsules of water that escaped from the tech were insignificant until everything dried up.

As a result they were ostracized. Now they wish to right their wrong and find the water they lost. They've ventured into the plateaus, returning to the SteamWell factory where they once worked in search of this water.

However, the plateaus are dangerous, barren wastelands. Because everything's dried up, things are constantly on fire, and there's no life, or oxygen. So the character uses technology as a method of making their venture possible.

Character Design

- Name: Christian Vance
- Age: 34

- Gender: Male
- Height: 5 Feet 9 Inches
- Eye Color: Black
- Hair Color: Brown
- Race/Nationality: African American
- Abilities: Gravity Device that allows the player to pick up objects much larger than themselves.



Figure 3: Character Design - Initial character design sketch for Christian Vance uncloaked.

Game Overall Map



Figure 4: Game Map - Map consists of 3 major areas that the player will venture down to explore. This includes a Mailroom, Maintenance/Control Room, and The Heart of Steamwell/Core in that order.

Game Beat Chart and Description

The overall game will take an estimate of 10-14 minutes to finish based on how quick the player solves the puzzle in each section. Based on estimated difficulty the following sections should take the following amount of time, give or take 1 or two minutes based on player experience.

- Mail Room - 3 Minutes
- Maintenance/Control Room - 4 Minutes
- Heart of Steamwell - 5 Minutes

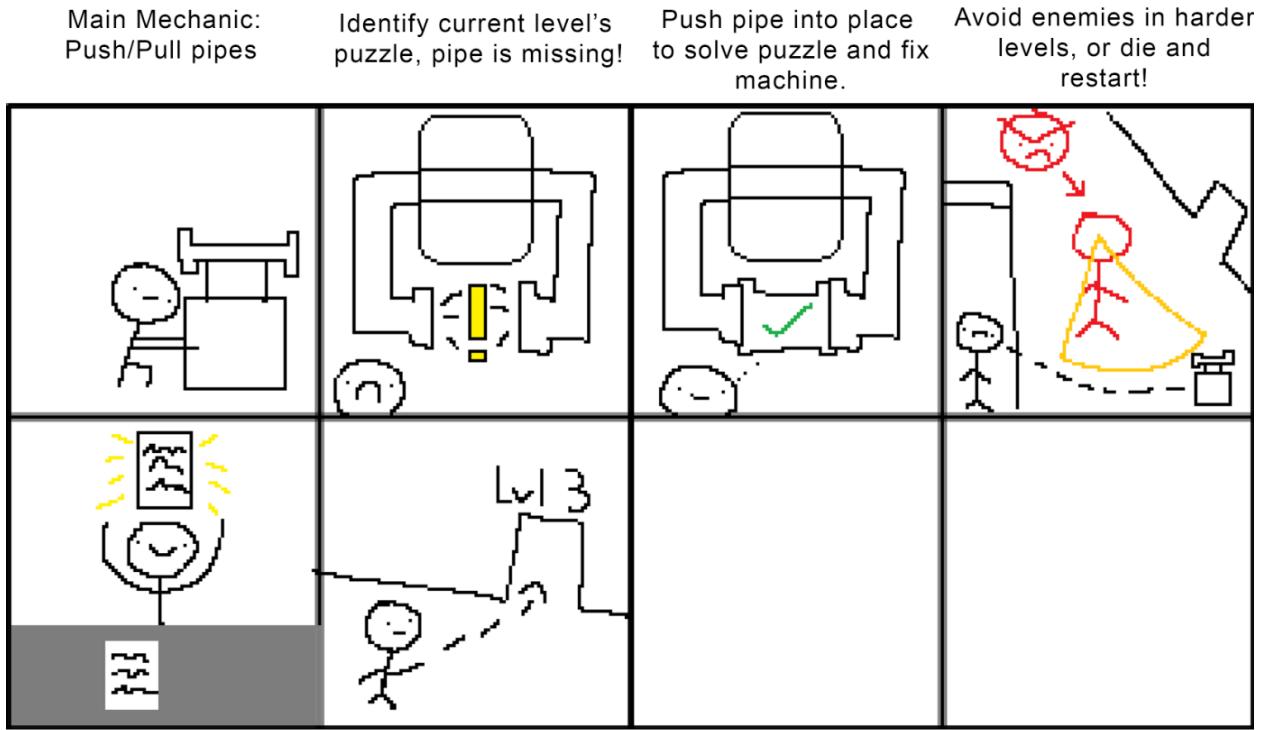
Intro/Outro Cut-Scenes

- Intro cutscene title: Christian Vance is kicked out of the company after attempting to steal water compression technology and losing half of the Earth's water.
- Outro cutscene title: Christian Vance reaches the Heart of Steamwell and restores flow to the surrounding Earth, making up for his mistake.

Game Beat Description

- Player's goal: Find the water they lost
- Story beat: Venture into SteamWell to find the water you lost!
- Wow! moments: Entering the Mailroom (Exposure to grandeur), falling into the steam room, the heart of the factory.
- Watercooler moments: Reading lore, scattered notes, secrets, npc's
- Advantages: Level specific objects to complete puzzles
- Disadvantages: enemies, puzzles.
- Bonus/Other: secrets.

Gameplay Board



Discover hidden lore
blueprints for light
narrative and puzzle
clues.

Continue down linear
path to progressively
harder puzzles.

Figure 5: Gameplay Board - Gameplay board that illustrates the main gameplay loop which consists of pushing/pulling, avoiding enemies, finding clues, and continuing the linear path to harder puzzles!

Game User Interface

HUD

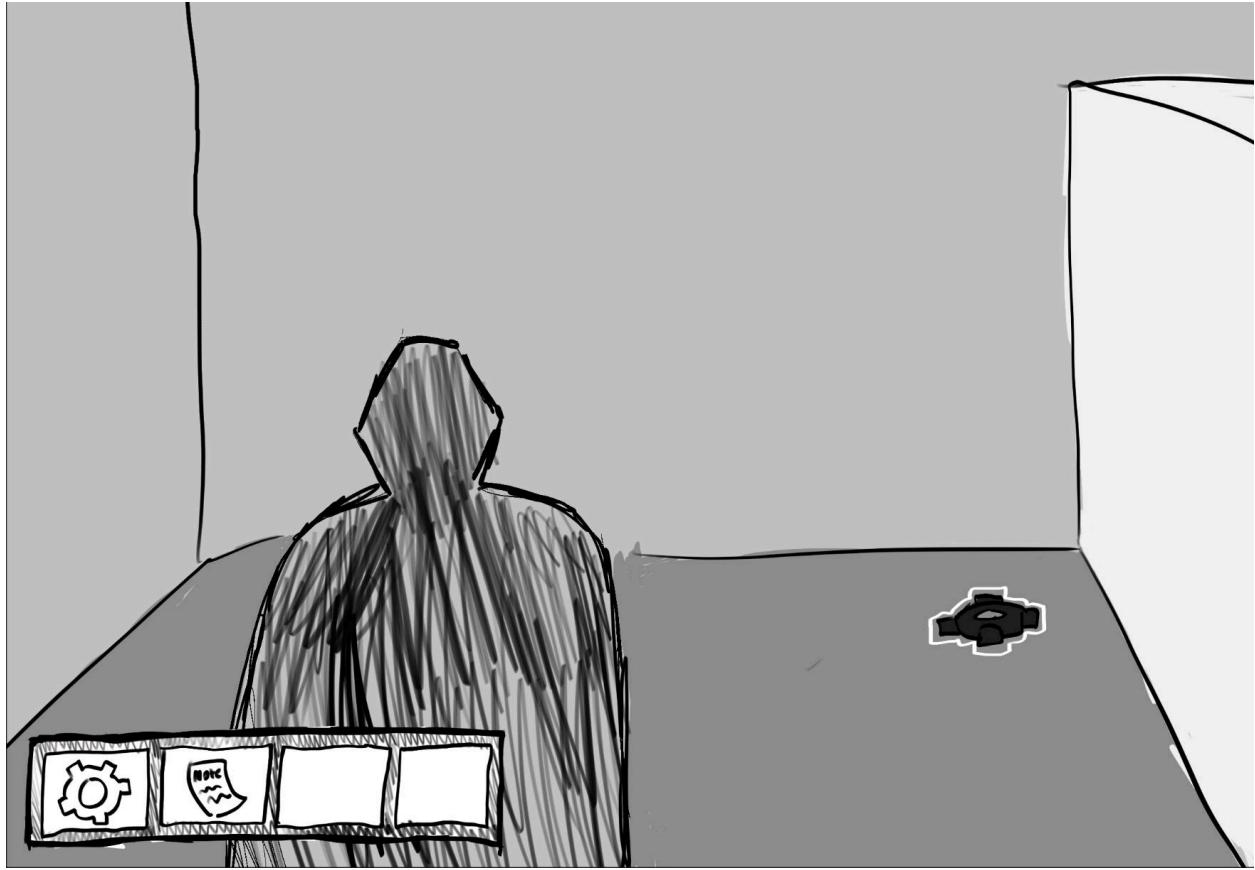
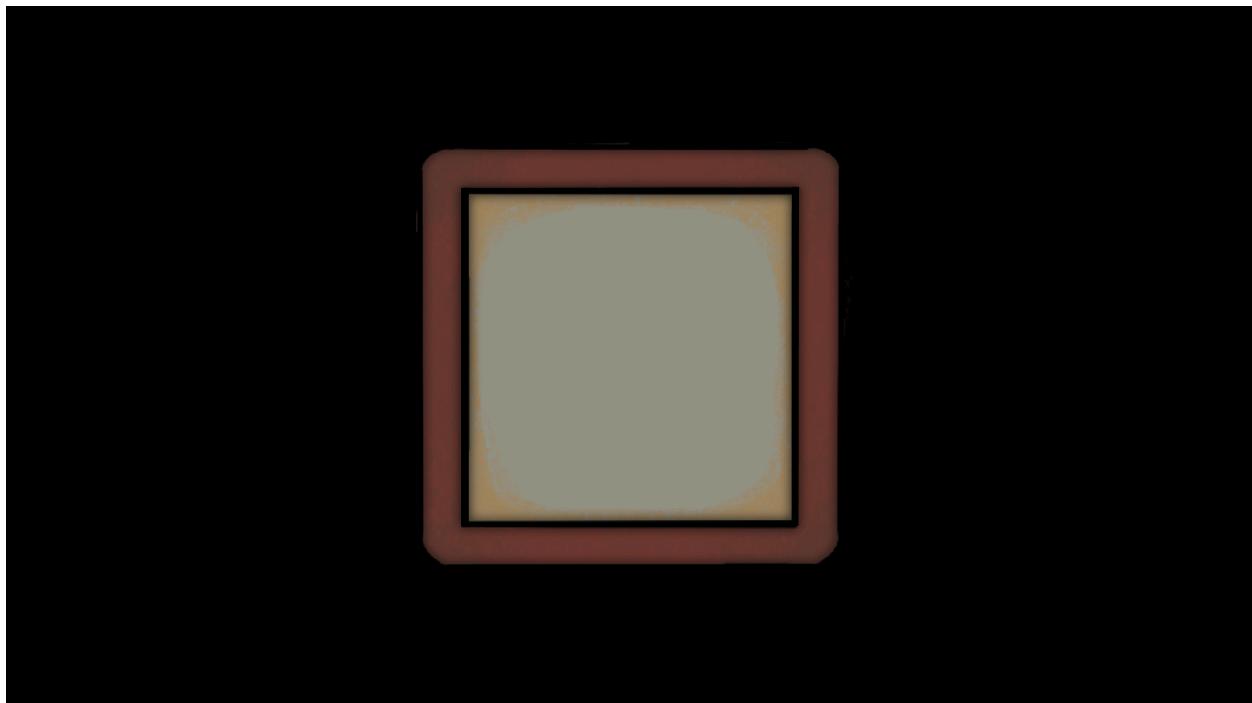
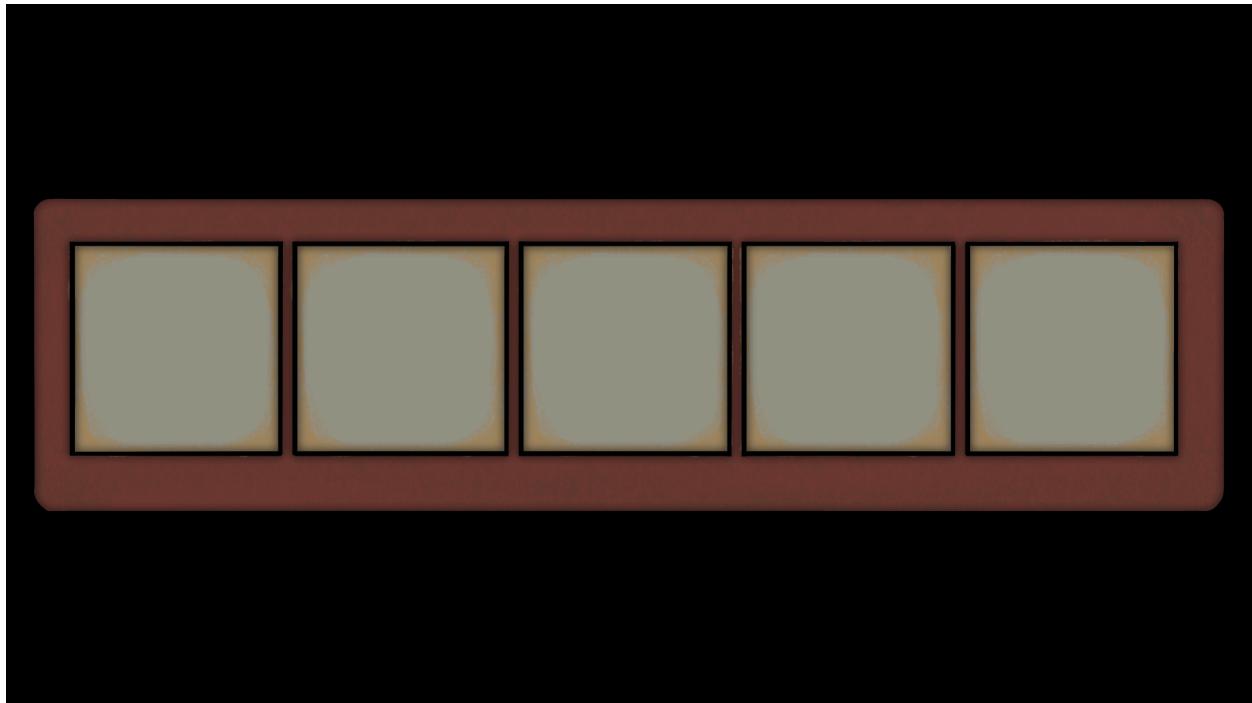
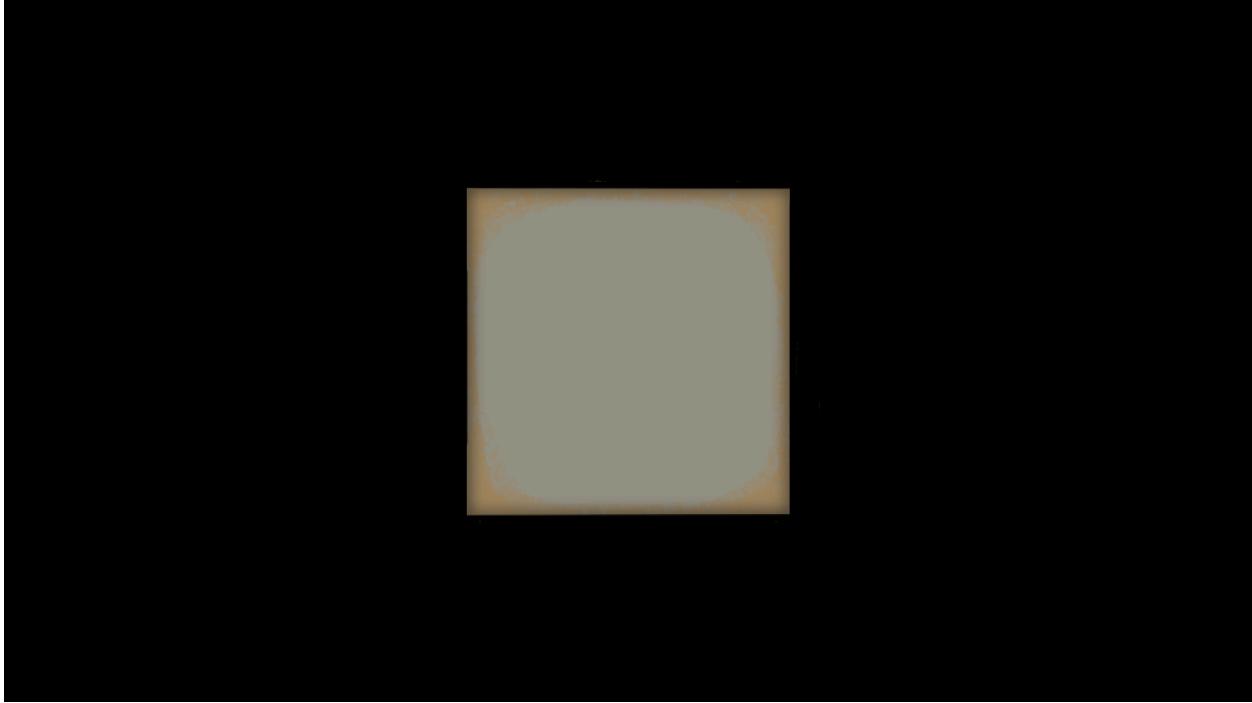


Figure 6: HUD - First draft of HUD which consists of an inventory with multiple items. Additionally items, such as the gear pictured on the floor, will be highlighted to signify you can interact with it.

Inventory Concept Art and Individual Pieces





Above is the 3 initial inventory art in addition to its individual square pieces in case we need to adjust or manipulate the inventory in Unreal Engine.

Controls

Player Action	Computer Key or Button	Xbox +/or MobileDevice
Walk	W A S D	Left Stick
Push	P	Right Trigger
Crouch	Control/C	B
Peek Right	E	Click Right Stick
Peek Left	Q	Click Left Stick
Pickup/Interact	Left Click	X
Pause	Escape	Right Start Button

Instruction: Player will walk through the factory in third person and be able to interact with objects for puzzles and avoid enemies by crouching and peeking.

Outside of Game Elements

Installation

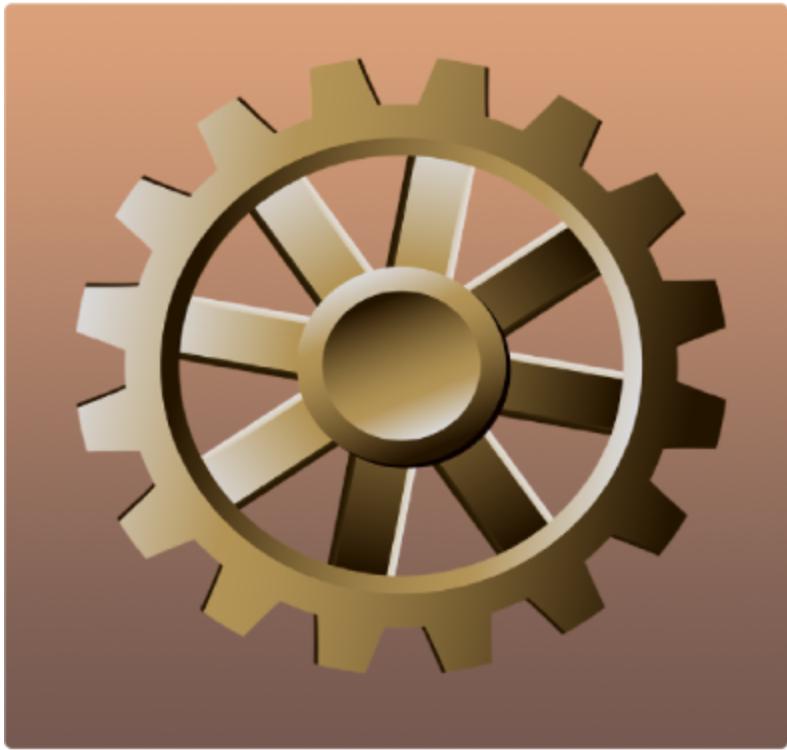


Figure 7: Application Icon - First draft of application exe icon.

Game will be installed via unzipping the exe file of the respective platform the user would like to play from.

Title Splash Screens

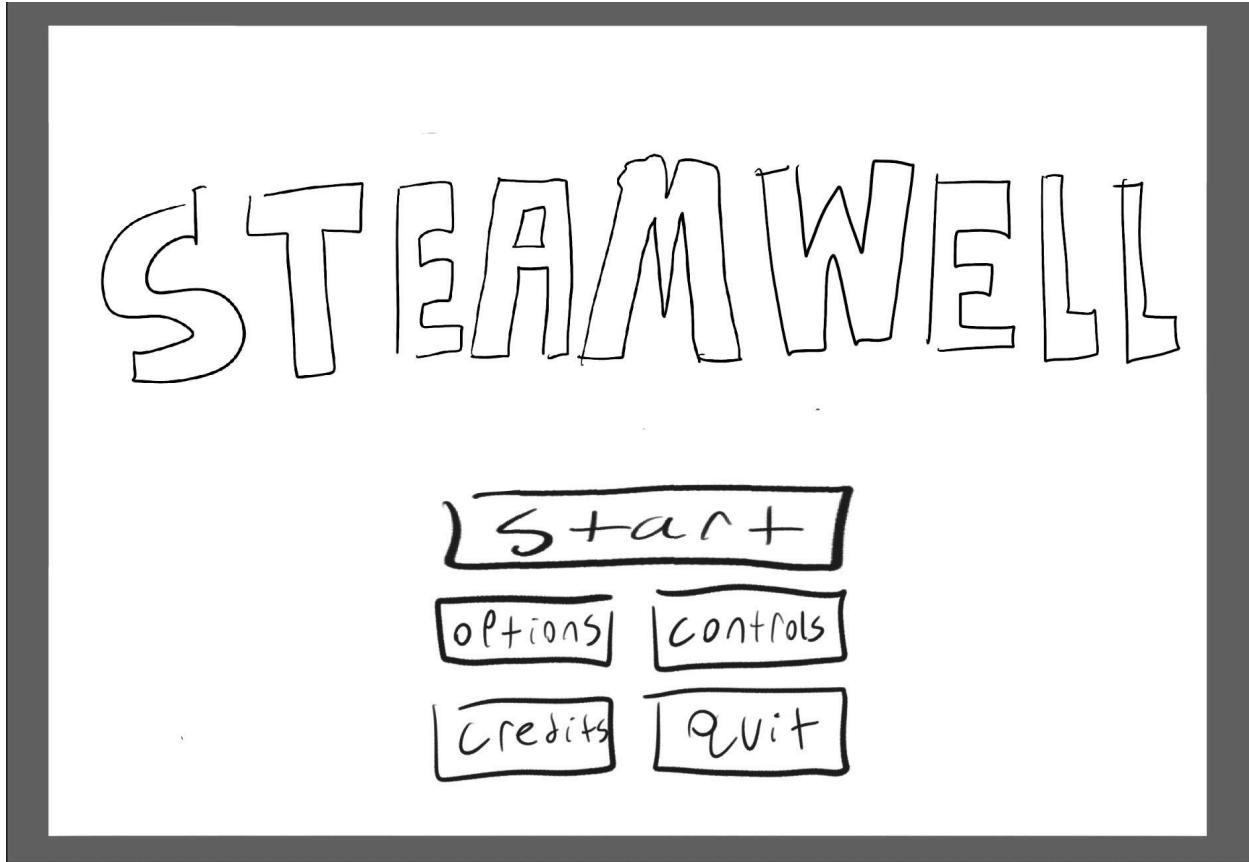


Figure 8: Title Screen - First draft of title screen. Will always include the illustrated buttons.

Main Menu

- Start/Play
- Options
- Help/Controls
- Credits
- Quit

Options Screen

- Volume
- Screen Resolution

Pause Screen

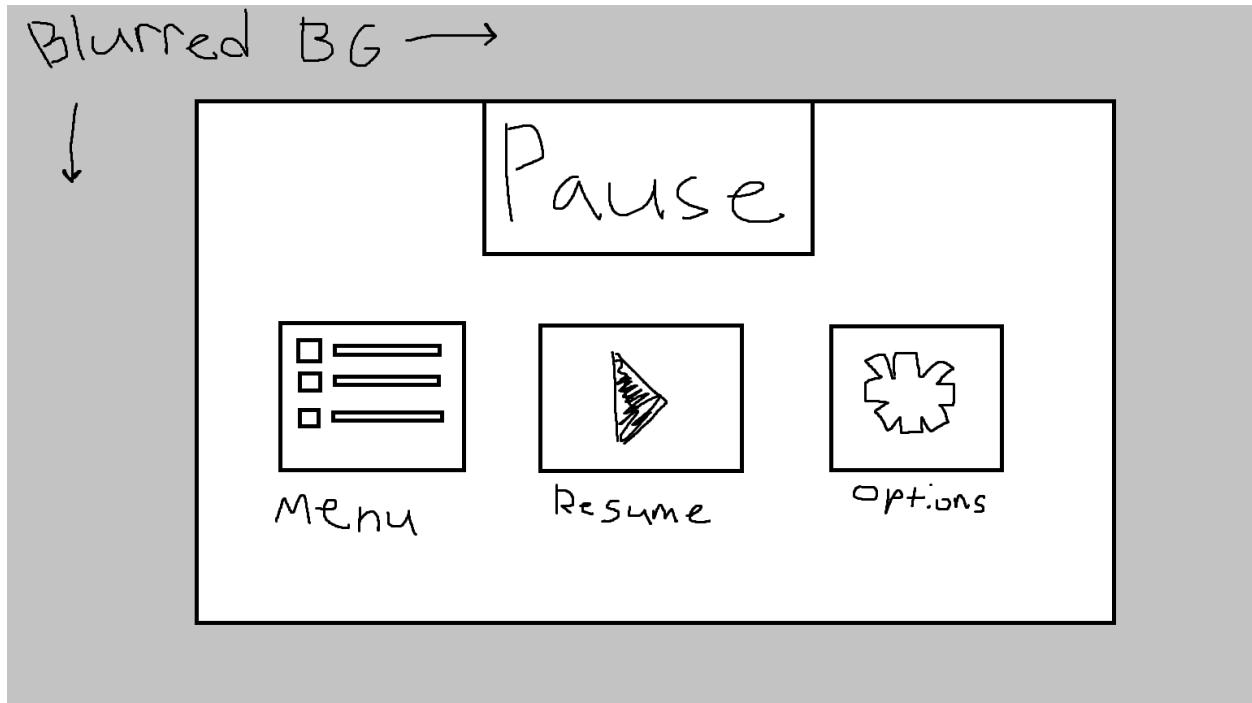


Figure 9: Pause Screen - Pause screen will blur the background and show the UI above. Click on 1 of 3 buttons to be taken to the menu, resume the game, or the options menu.

Game Over Screen

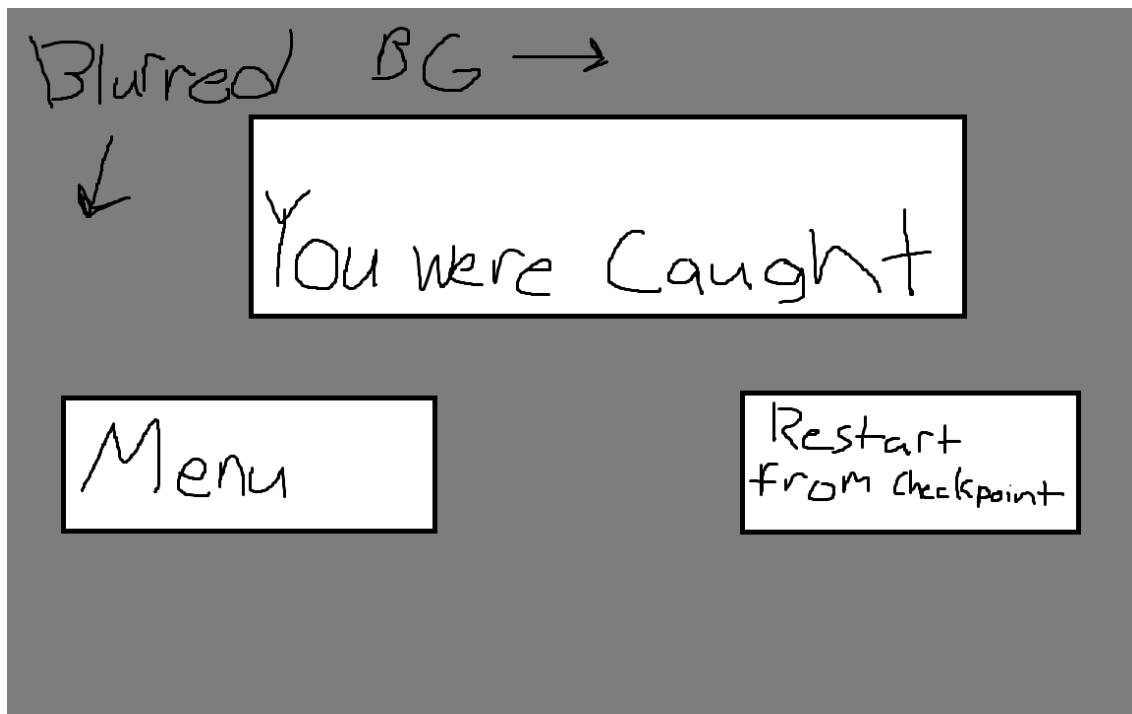


Figure 10: Caught Screen - Similar to pause screen, Caught screen will also blur the background and show one of 2 buttons. Menu will return you to the menu screen and Restart From Checkpoint will bring you back to the last checkpoint to try the level section again.

Credits Screen

Dr. Toprac - Producer
 Jiwon Park - Assistant Producer
 Atilla Istami - Programmer
 Edward Ramon - Narrative Design, Game Design
 Joy Ekechukwu - Programmer, Game Design
 Lila Mali - Concept Artist
 Maxmillion Maldonado - Technical Lead, Audio/Game Designer, Scrum Master
 Patrice Hayes - 3D Artist
 Stephan Ozan - Programmer

Audio Plan

Content Music Aesthetic: Industrial Dark Ambience
 Overall Feel Aesthetic: Melancholy; Anticipation



Figure 11: Mood Wheel - The goal of feeling for the music is to strike a balance between melancholy (Sadness) and anticipatory (Anticipation) tones as this supports the derelict state of the world in addition to the unknown threats of the factory.

Overall plan for audio is to collect sounds from different sources such as audio databases, games, films or foley if needed. ALL audio will be converted into .wav file formats to compile into Unreal Engine, audio will be edited in Adobe Premiere Pro utilizing effects/mixing. We are currently building a large sound file to pull from consisting of many audio files that may fit into the game, prominently consisting of industrial sounds. See Appendix for details.

Audio Inspiration

- Oddworld: Stranger's Wrath
- Call of Duty: Zombies
- Fallout

Technical Development Plan

Steamwell will be created using Unreal engine. The game will feature 3 main levels that will progress linearly as each puzzle is completed in the respective zone. The game world consists of the player traversing down into the underground depths of the factory, each level having a progressively more difficult puzzle than the last. Alongside the linear level progression, a narrative will be told alongside the puzzles through environmental storytelling, voice lines and lore tabs. See Appendix for details.

Appendices

Appendix A: Team Contract

GOALS

The biggest goal is to create not just a game, but a good game. In order to achieve this we must ensure the project remains within a manageable scope, allowing it to be refined into a fun experience and iterated upon in a timely manner. We aim to avoid situations where we face crunch, as stressful development conditions translate to a less enjoyable game.

Together, our goals are to ensure we keep healthy time management habits and a working pipeline for code, art, audio etc for each sprint in the process. Individually, we will continue to refine our skill sets and consistently work on quality features that improve the games playability or are fun to experience.

Team Goals

- Create a great game.
- Continue to refine our talents and skill sets.
- Foster a culture of consistent honest feedback, reliability, and respect.
- Understand that making any game is hard, and is an iterative process.

Team Member Goals

Atilla Istami

- Apply coding skills to establish a 3D game coding pipeline
- Keep consistent code standard across development

Edward Ramon

- Build out a narrative that has depth but is manageable to experience in 10-15 minutes.
- Work with other team members to establish a story that can be experienced through notes, environment and voice lines

Joy Ekechukwu

- Apply coding skills to establish a 3D game coding pipeline
- Keep consistent code standard across development

Lila Mali

- Collaborate with team members to establish tone, design and layout of level or feature based on narrative

Maxmillion Maldonado

- Keep documents up to date
- Collect audio passively to ensure we can always pull when needed
- Ping everyone for scrum at 9pm every night

Patrice Hayes

- Keep consistent modeling schedule to ensure assets are delivered on time

Stephan Ozan

- Apply coding skills to establish a 3D game coding pipeline
- Keep consistent code standard across development

EXPECTATIONS

- Try to attend every class to discuss progress and ideas, if you can not make it that day, let us know so we can plan accordingly.
- Create quality features each sprint that meet all team standards. Ensuring we have quality features each iteration helps us to continue improving on other pieces of the game, instead of remaining static.
- Remain respectful and professional during all discussions and development matters.
- Always feel safe to ask for help to ensure the best product possible through collaboration.
- When a conflict arises, whether interpersonal or game-related, speak with the team honestly about it.

POLICIES & PROCEDURES

- Utilize Discord or the group chat to communicate with teammates about games or updates.
- Work on the game for a minimum of 12 hours a week per member.
- When you are unable to work on the game for the expected time or cannot make it to class, inform the group chat so we can plan accordingly or provide help.
- Utilize proper Gitlab and Git systems to ensure we are operating on up-to-date projects.
- In Gitlab, ensure a working development branch is always available so that other team members can access it or can revert to it in case of corruption.

CONSEQUENCES

As stated before, if there is an issue, please consult the team; we are here to help. If you fail to communicate with the team, we must continue working on the game as planned. A prolonged lack of communication or work may result in being removed from the team.

COMMITMENT

We share these goals and expectations, and agree to these policies, procedures, and consequences. We fully understand and agree with the contents of this document.

I agree with the contents of this Team Contract.

Atilla Istami

Edward Ramon

Joy Ekechukwu

Lila Mali

Maxmillion Maldonado

Patrice Hayes

Stephan Ozan

Appendix B: Art Style Guide

Theme Overview

Our game is a dystopian puzzle game. The player should feel anxious and stimulated with the puzzles so as to not be spotted by enemies. The environment makes the player feel small and overshadowed with the large levels and vast environments that feel too big to take place in a real world. The look of the game will be dark, dilapidated, but futuristic in the steampunk aesthetic.

Quick Summary

Our game has a steampunk visual style without victorian elements that takes place in a dilapidated world with little bright colors and dark tones.

Our game has a steampunk visual style without victorian elements that takes place in a dilapidated world with little bright colors and dark tones. The environment makes the player feel small and overwhelmed with the large levels and vast environments that feel too big to take place in a real world. The look of the game will be dark, dilapidated, but futuristic in the steampunk aesthetic without victorian architecture.

Architecture and Anatomy (ANA)

Character - An anti-hero breaking back into the factory to fix their mistake. Their identity is unknown and they are majorly affected by the environment of the world as they have a modification to their body that helps them survive in the very arid world. They are worn, careful, and not a fighter, but will stop at nothing to get to the heart of the factory. They wear a cloak to not be identified.

Environment - This factory is in the middle of a wasteland. The only stable thing in the world really. It's a grand factory that stands tall and almost seems to be a symbol of the power this company has over the world. The inside is a different story as papers scatter the ground, gears are off their designated machines, and pipes are out of place. The factory still works just fine somehow despite clear signs of dysfunction. Bots scan the area for intruders. The deeper you go into the factory, the more small and intimidated the player should feel.

Props - Items found are worn but functional. They belong in this factory, but are not used frequently.

Final Boss - The heart of the factory is a glowing red core that contrasts everything the player knows about the factory. The factory is messy and dysfunctional but the heart keeps it running. It glows a bright

neon red with pipes that line the walls of the factory's core. It's big, mechanical, and feels like it's own machine.

Lighting

We will use dark moody lighting to compliment the dark color palette of the game.

Materials/Textures

Many textures will be mapped onto the model in order to give it a stylized Playstation 1 appearance.

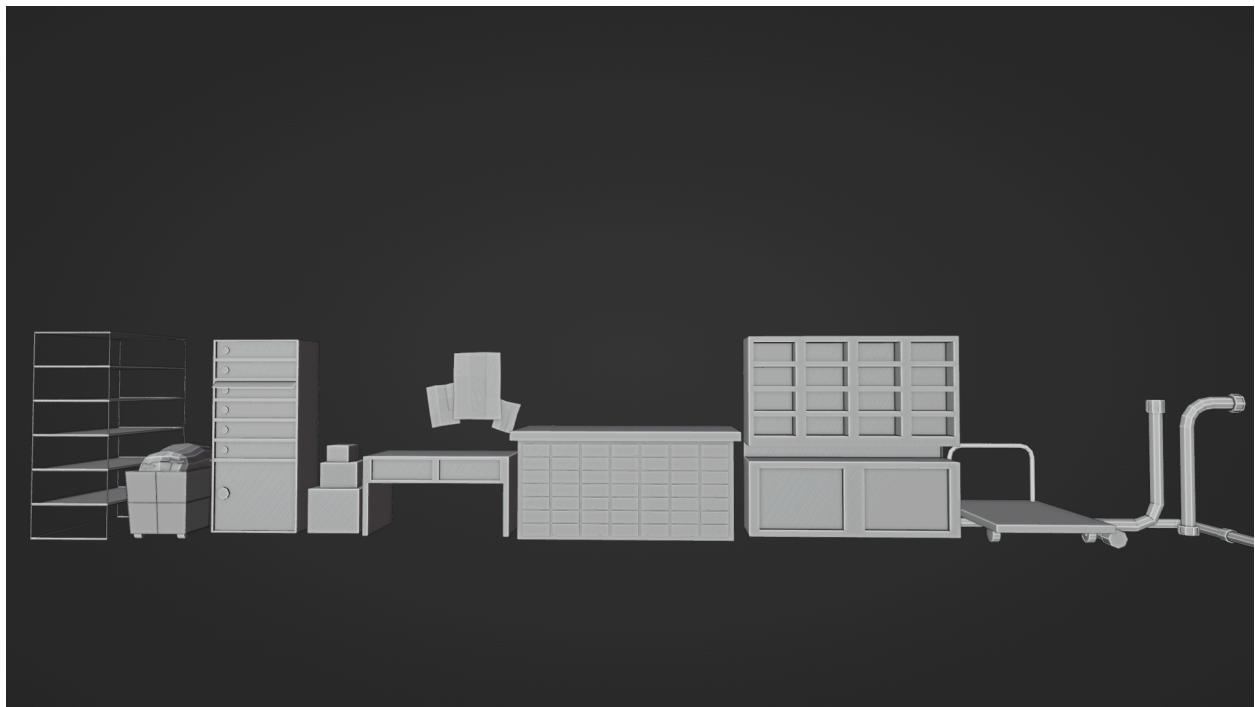


Figure 12: Texturing and Models - A file cabinet texture placed onto a model in order to prove a working pipeline. The left is full resolution while the right is compressed which is more of the style we are striving toward.

Color



Figure 13: Color Palette - Both sets of colors represent the derelict and faded nature of the world. The colors are very gritty in nature and will fit very well within the game environment.

Proportion/Scale

Everything in the world will be proportional to the player, who is about 2 meters tall. The only models that will be larger will be the automata, or enemy robots, which are slightly bigger.

Unit of Measurement/Scale

This game will be produced using the metric system, as it is the easiest to work with.

Characters



Figure 14: Character Face and Full Body - Further concept art of character face mask and cloaked model.

Environments

Level 1 - The Mail Room

This is where the character is introduced to SteamWell, as well as what has happened to the world. Paper scattered that says “Water Lost” then once within the mail room hundreds of scattered papers that say “Water Needed!” The news, and its effects. Automata that are still in place attempting to file the papers.

Another important element of this area is scale. The receptionist area should be small, a normal office, then the mailroom should be massive. Making use of something called the “Venice Effect.” Utilizing scale to over exceed expectations.

This helps from an audience perspective but also from a world building perspective.

Important points for this Level:

- Narrative introduction
- Company status eluded to, therefore state of the world
- “Water Lost” a semblance of our characters motivations as a result, potentially through dialogue?

Level 2 - Control Room

Steam is common in this room, surrounded by vast amounts of pipes. This is the pathway to the water Christian lost. Complete a circuit of pipes as the puzzle in this room while avoiding a more consistent threat of enemies; however, there's no water, and, as a result, that means there's a path down. Have the player look down here to see the bottom. As well as see up to the hole they fell through.

The play space surrounds a hole down to the ‘heart of the factory.’ Automata can be seen falling down the central hole. A voice speaks here; the lines should effectively develop the state of the world and represent the state of the factory more effectively. “No water available.” “Pipes clearing.” etc.

Important points for this level:

- Narrative continuation, “I need to reach the bottom.” What's the need to go down? Express that.
- Company status is shown as dilapidated.
- Enter a pipe to reach the bottom.

Level 3 - The Heart of SteamWell

This has the highest concentration of Automata. It also has the heart of the factory, a system or larger Automata that always looks for the lost water. Hide from it at this level while looking for the water

yourself. This level is a more free design. Open floor with loose boxes, the boxes provide cover from the heart of the factory. Manipulate boxes and move sneakily to avoid its sight in this pursuit.

This is the culmination of the game. Therefore, the narrative must be complete at this point, which constitutes:

- The state of the world is fully shown
- Character motives are thoroughly expressed.
- Voice of Steamwell being fully developed
- Mechanics used to proficient level

Key Objects

Gear: a low poly gear

Notes: paper notes scattered about.

Pipes: pipes the player is able to move about

Boxes: overfilled filing cabinets and blocks of stone

Font

Google Font: Bitter

Penultimate

The spirit is willing but the flesh is weak

SCHADENFREUDE

3964 Elm Street and 1370 Rt. 21

The left hand does not know what the right hand is doing.

Figure 15: Character Face and Full Body - Font is slightly stylized but not too stylized as readability is a top priority, especially for a narrative experience.

Art Production Pipeline

Lila is the concept artist where the pipeline starts. She draws out sketches of assets, environments, characters, etc. For level designs, our level designer, Edward, will design levels and pass them to Lila to sketch out the level environment. After concepts are drawn out, they are passed on to Patrice, our 3D artist to model all the assets and environments. The model unwraps are then given to Lila to paint on textures and then given back to Patrice to UV format and polish. The art is then given to the programmers to implement. Patrice handles the animations as well.

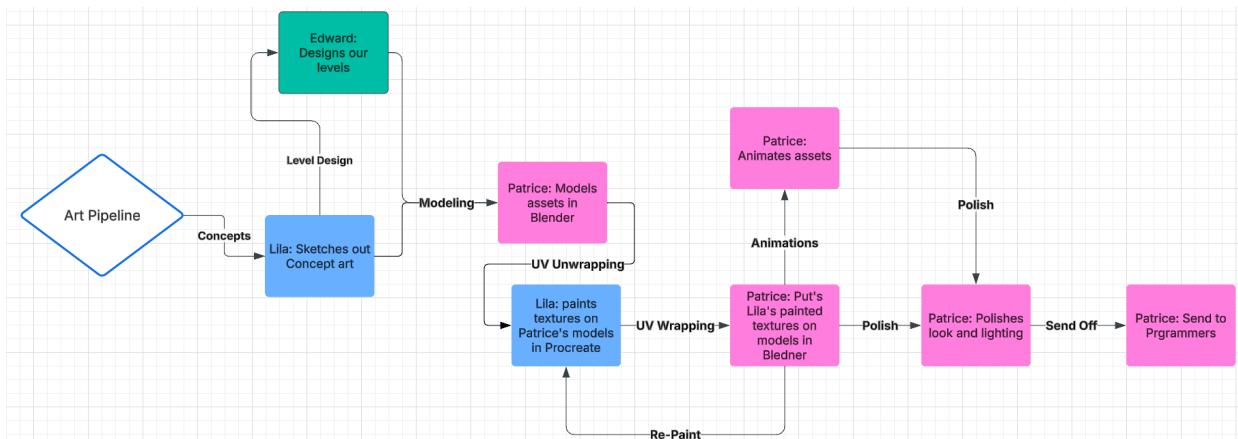


Figure 16: Art Production Pipeline Graph - Shows the full extent of our art pipeline.

Signatures verifying agreement:

Atilla Istami

Edward Ramon

Joy Ekechukwu

Lila Mali

Maxmillion Maldonado

Patrice Hayes

Stephan Ozan

Appendix C: Game Story Plan Details

Story

Below is a link to the narrative design document highlighting the game's narrative.

<https://docs.google.com/document/d/1OASE7aF5BKHHIVuZmx3sUc4t4uj-PvEwF37Xr3NqV6o/edit>

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Appendix D: World (Level/Section) Design Details

Overview of World



Figure 17: Overall Game Map - Features 3 connected areas that descend. This includes some transitional areas such as the lobby but the main 3 levels are the Mailroom, Maintenance, and Core.

Level or Section Summaries

The initial game will have 3 levels including:

- Mailroom
- Maintenance/Control Room
- Heart of Steamwell/Core

Level 1: Mailroom

Estimated Completion Time

- Beginner: 5 Minutes
- Experienced: 3 Minutes

Level Description

Players venture into a mailroom filled with important documents, letters and cries for help. All fell on deaf ears. Move the shelves in order to find the 3 gears needed to open the door. Shelves must be moved in a strategic way in order to avoid shelves from running into one another, or a shelf being unable to move because another is in the way. Find all 3 gears and move the shelves all without being detected by guards.



Figure 18: Mailroom Concept Art - Concept art of the Mailroom layout showing the player and automaton enemies.

Map Concept

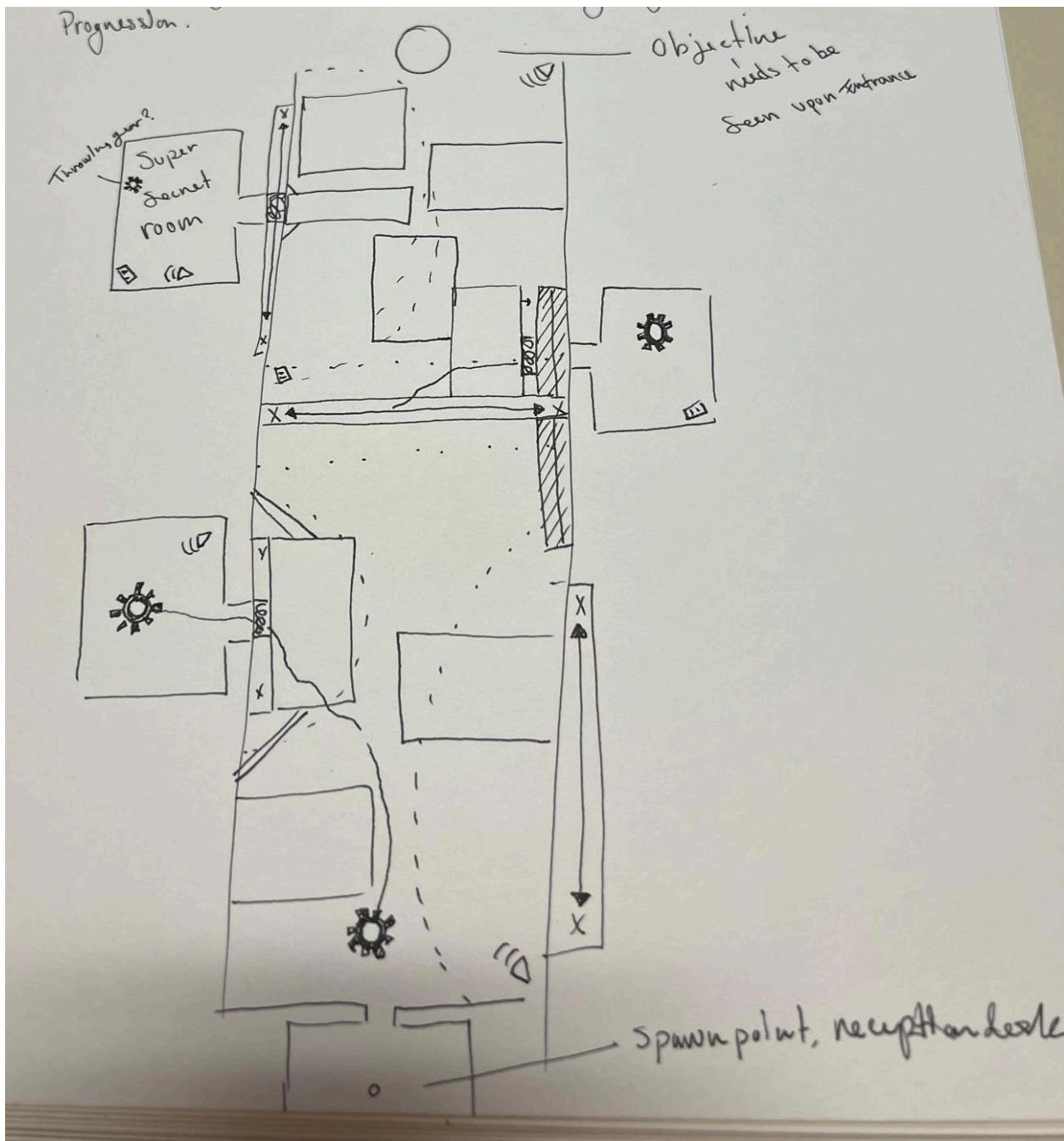
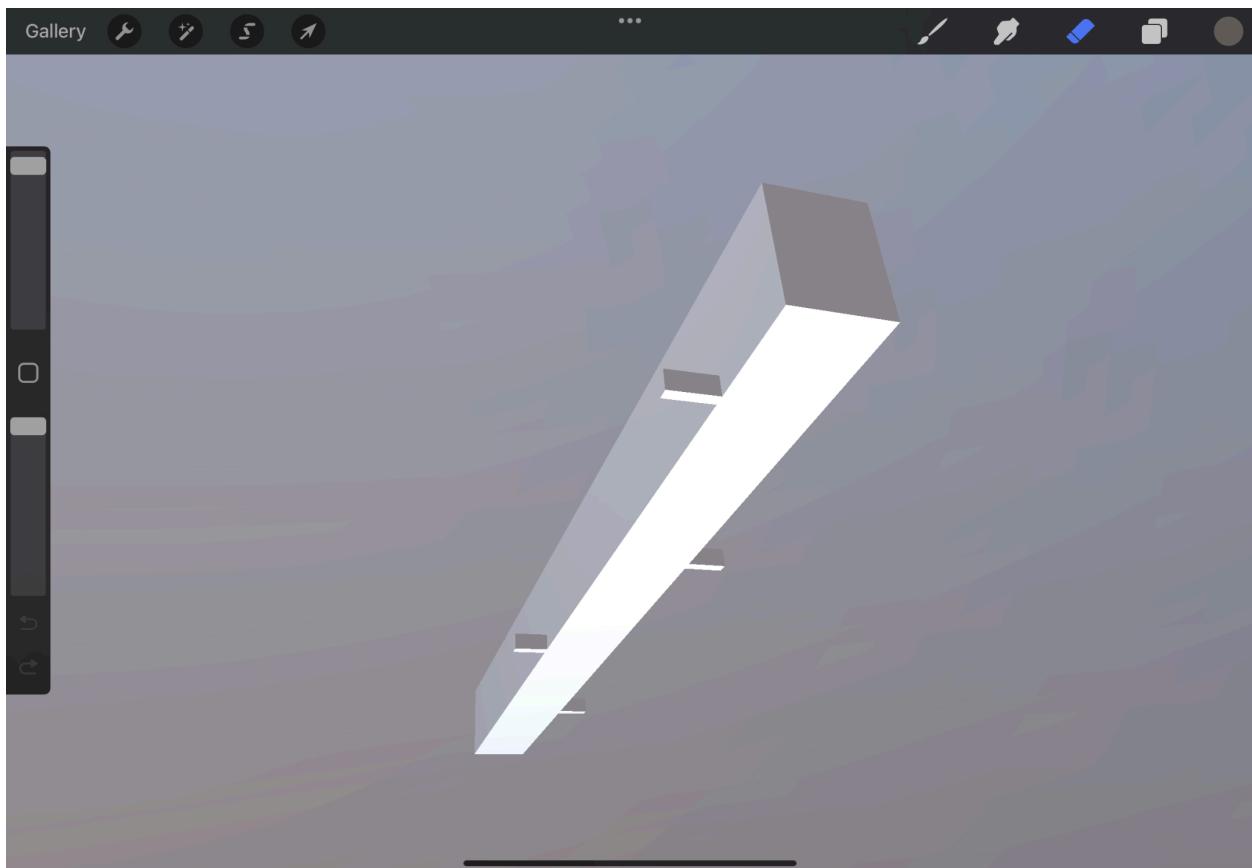
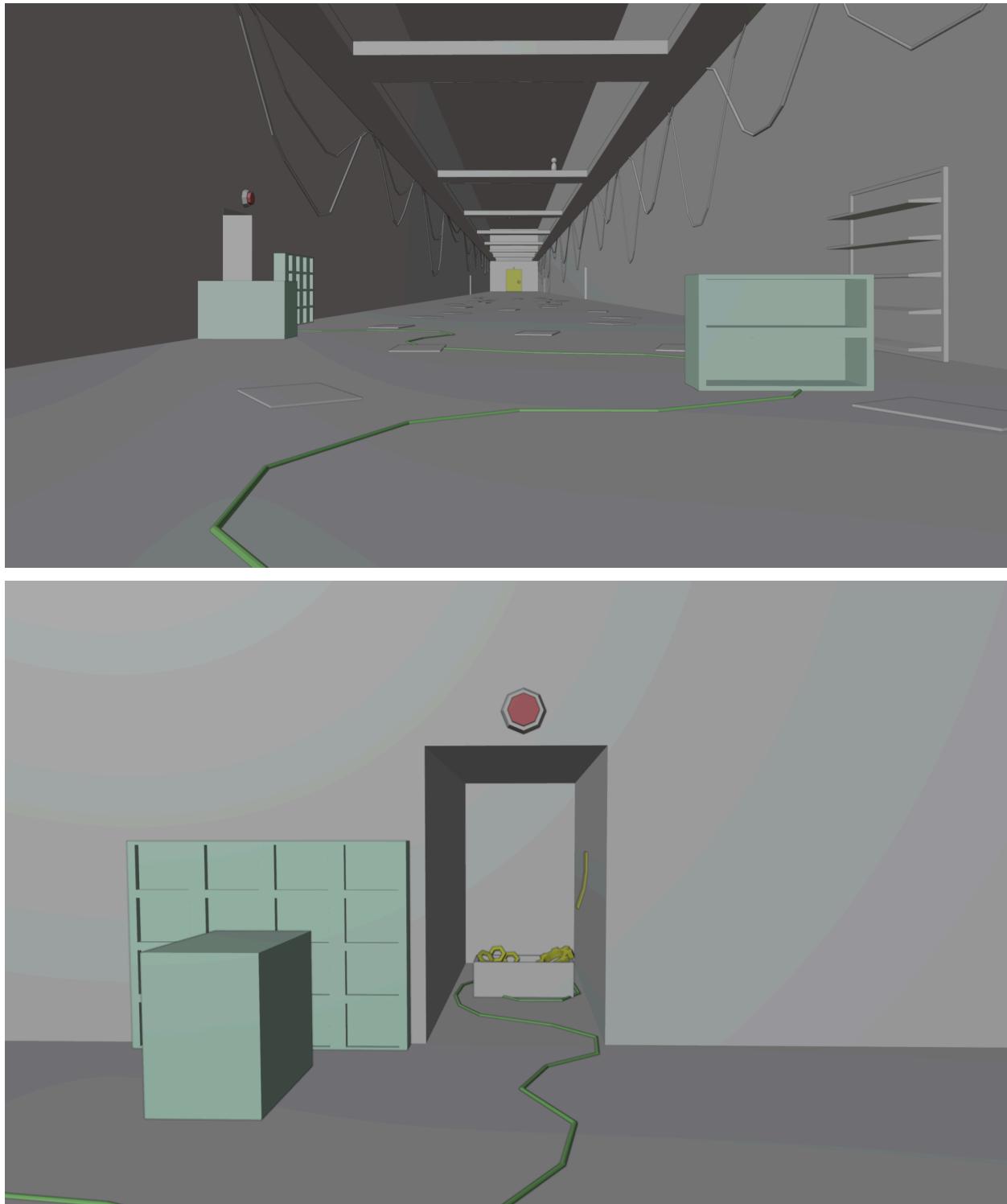


Figure 19: Mailroom Level Layout - Shows the layout of level one, focuses on a long hallway for progression rather than the original idea of a large square room.

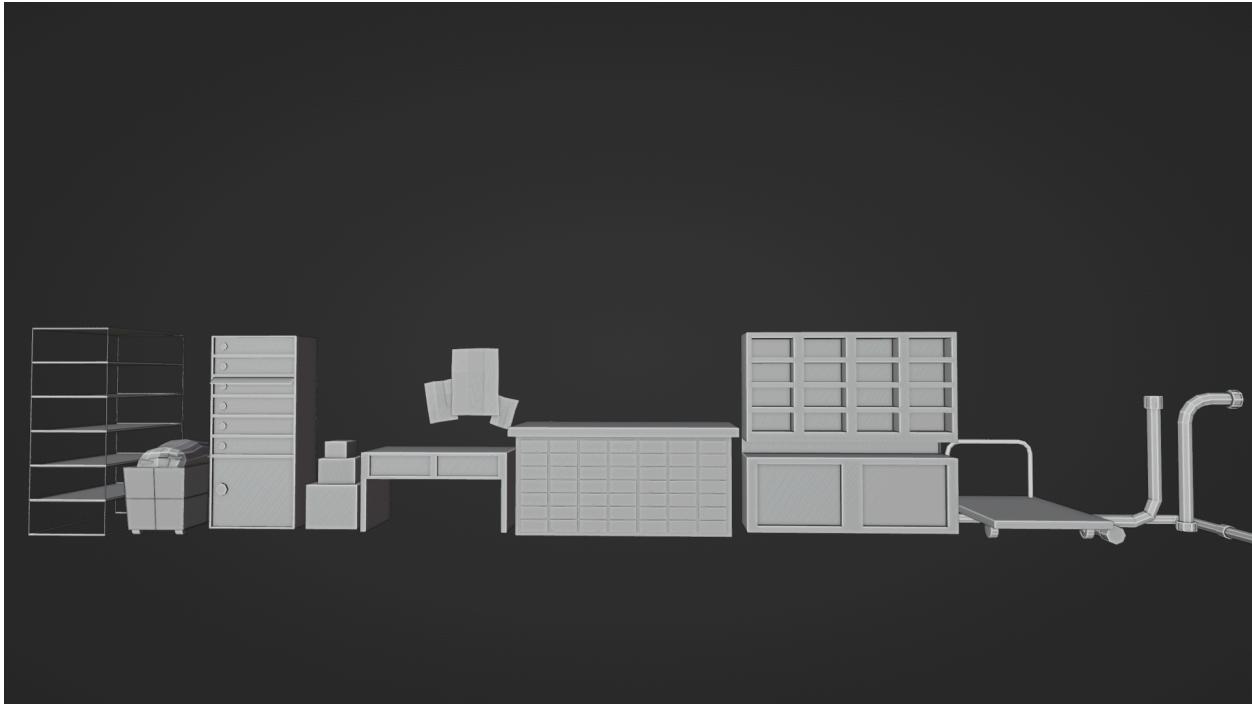
Initial Level Geometry Gallery (Without Lighting)





Initial draft of greyboxing level layout. We have developed a longer linear level to enhance the feeling of progression and give a greater emphasis on learning mechanics rather than exploration at the beginning of the game.

Individual Level Models



Initial draft of models utilized for the mail room. Consist of models that can easily be duplicated and placed throughout the level and still make sense.

Level or Section Aesthetics

- Corporate yet also abandoned
- Isolation in an uncanny way, to some degree liminal
- The MailRoom
- Beige, office colors



Color Palette for Level 1

Level or Section Beat Description

- Player's goal: Reach the Main Chute
- Story beat: "no water"
- Wow moments: Voice notes, enemies watching areas.
- Watercooler moments: HiddenRooms
- Advantages: Gears, and notes
- Disadvantages: Automata, boxes
- Helpers: wires
- Bonus/Other: secret rooms

Level 2: Maintenance Room

Estimated Completion Time

- Beginner: 6 Minutes
- Experienced: 4 Minutes

Level Description

This is the middle point between the mailroom and the heart of the factory. Enter this area to progress further into the facility in search of water. Here, the player will find pipes of appropriate sizes to finish the main chute to continue to the heart of the factory.

Map

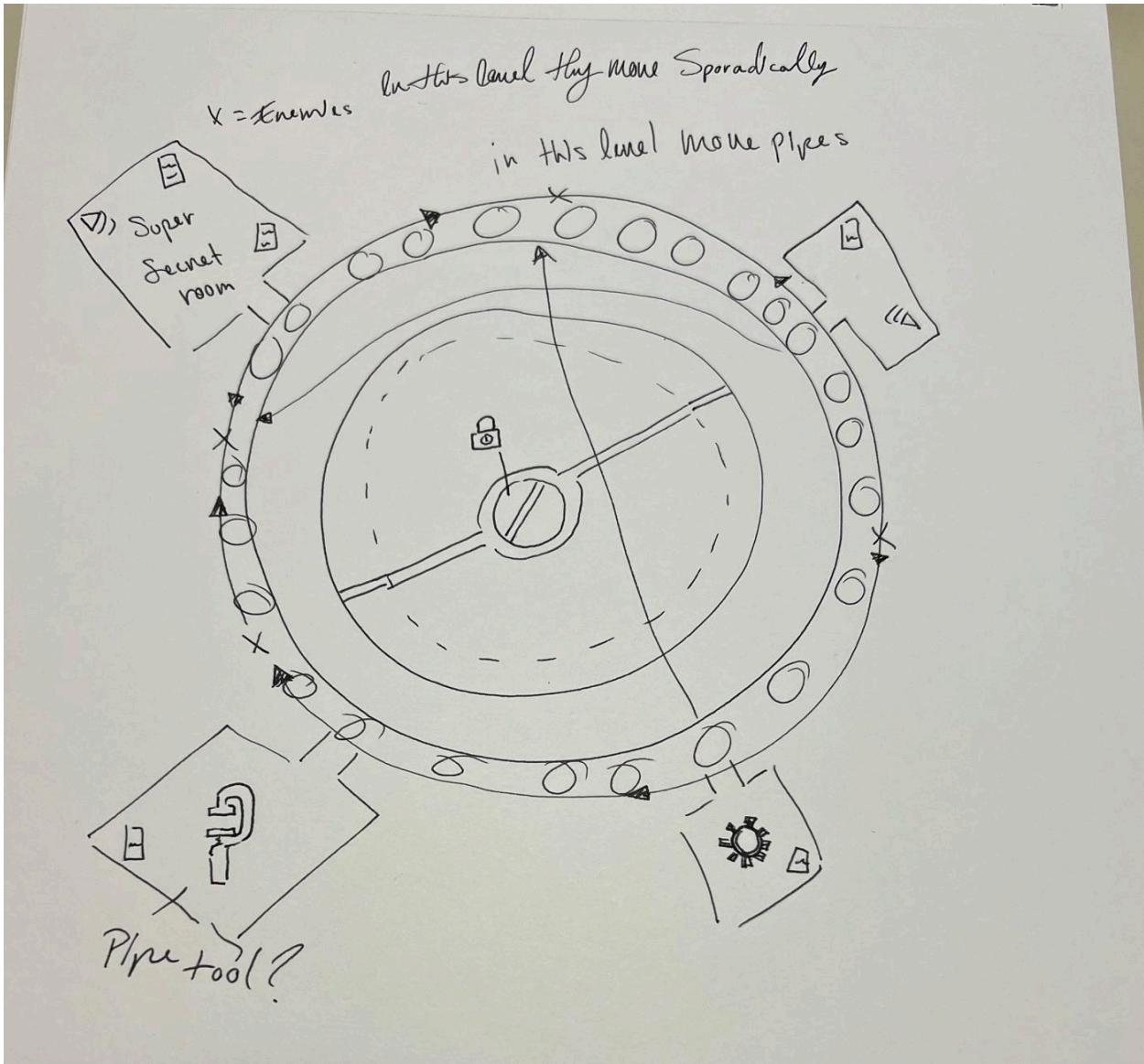


Figure 20: Maintenance Room Layout - Shows the layout for level 2. It is very much the opposite of level 1 in terms of layout as it is circular and gives the player a bit more freedom for venturing the puzzle.

Level or Section Aesthetics

- Cold Blue
- Isolation, haste.
- What is the setting: dark pipe area, industrial
- Ocean blues for the color palette

Level or Section Beat Description

- Player's goal: Put pipes in the correct area
- Story beat: Develop the voice of the company and the realization of the character's fault.
- Wow moments: Hastily run around the chute placing pipes where they go.
- Watercooler moments: Hidden rooms, center area
- Advantages: Gear, notes
- Disadvantages: enemies, level design
- Helpers: hidden areas
- Bonus/Other: secret areas

Level 3: Heart of the factory

Estimated Completion Time

- Beginner: 7 Minutes
- Experienced: 5 Minutes

Level Description

This is the boss fight level, although not necessarily a fight. Find the water! Look around the arena in search of the water lost. All the while, the boss character, the heart of SteamWell, also searches. Do not be seen!

Map

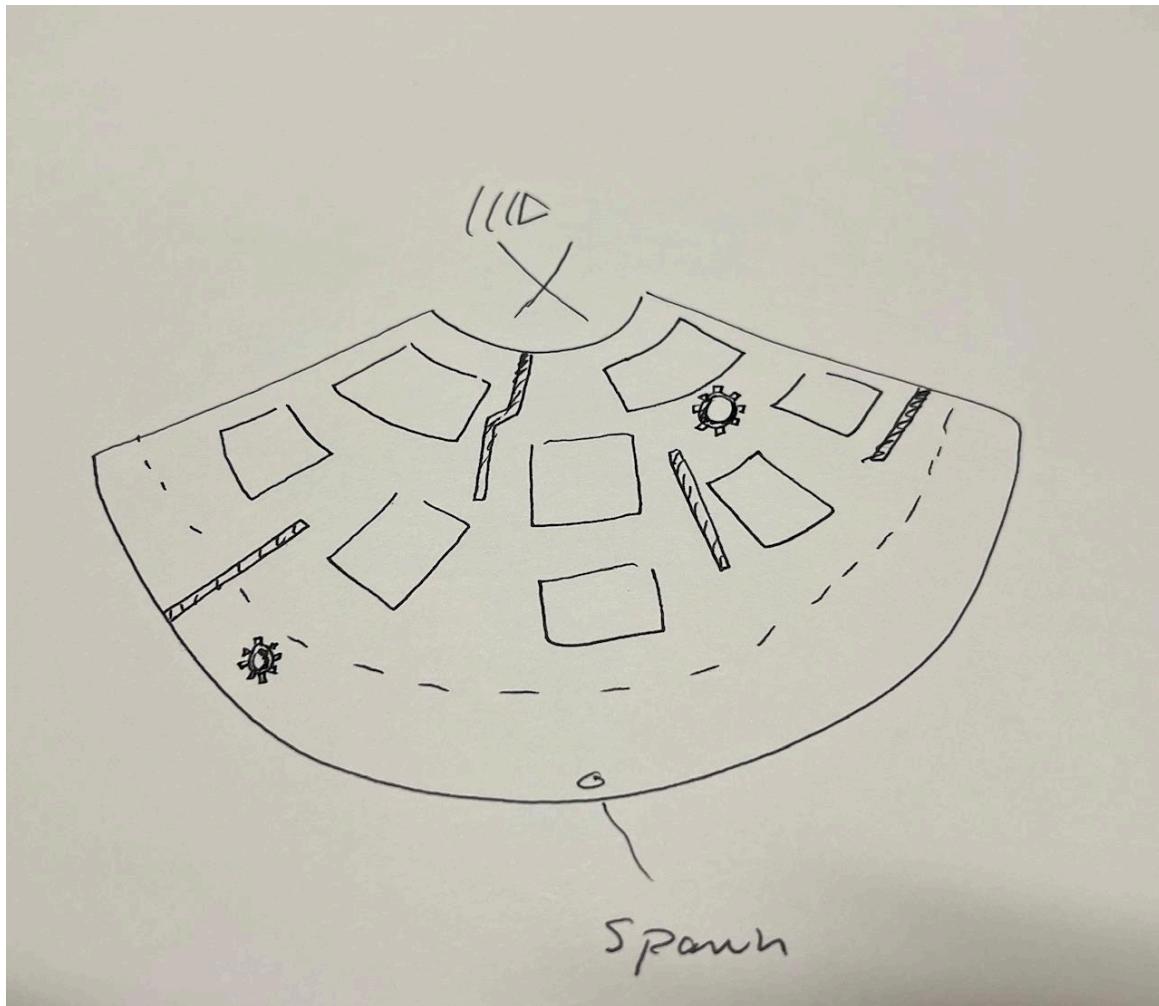


Figure 21: Heart of Steamwell Level Layout - Shows the layout for level 3, our bossfight which will consist of a giant Bot at the X and a freeform puzzle you must navigate.

Level or Section Aesthetics

- Cold blue contrasted by magma reds and yellows
- Boss fight, danger and isolation
- What is the setting: The magma colored heart of the facility.
- Cold blues contrasted by magma reds and yellows

Level or Section Beat Description

- Player's goal: Find the lost water in the level, and return it to its different ports within the level.
- Story beat: The return of water, as well as the complete facing of one's mistakes.
- Wow moments: Boss entrance
- Watercooler moments: Returning the water to their ports
- Advantages: Gears to throw
- Disadvantages: N/a
- Helpers: N/a
- Bonus/Other: Hidden room

Signatures verifying agreement:

Atilla Istami

Edward Ramon

Joy Ekechukwu

Lila Mali

Maxmillion Maldonado

Patrice Hayes

Stephan Ozan

Appendix E: Audio Plan Details

Overall Goals

Content Music Aesthetic: Industrial Dark Ambience

Overall Feel Aesthetic: Melancholy; Anticipation

The goal of the music is to support a melancholy and anticipatory aesthetic that the game aspires to. Melancholy due to its setting on a derelict world and wasteland and anticipatory due to the enemies in each level being able to find and catch you if you are not careful.

Audio Technical Requirements

- **Sound formats: .WAV**

All audio must be in a .WAV format to be imported into the Unreal engine, otherwise it will fail when attempting to place it into the editor.

Sound FX

- **GUI:** Button clicks, window opening, command acknowledgments
 - Menu/Pause/Death Screen
 - Button press: Small metal clank
 - Start Button: Cinematic loud metal clang
- **Units/Characters:**
 - Player
 - Jump
 - Land
 - Footsteps
 - Crouch
 - Peek left/right
 - Detected
 - Voice lines for level
 - Enemy Robot
 - Voice lines for level
 - Hover/walk
 - Player detected alarm
 - Ambient beeps/boops/chirps
 - Ambient metallic noises

- Enemy Boss Robot
 - Loud reverberated animatronic movements
 - Bombastic voice lines for level
 - Loud more sinister alarm
 - Ambient beeps/boops/chirps
 - Bass heavy hover/walk
- **Game Play Elements:** Pick-up jingle, alerts, ambient sounds
 - Pickups
 - Metal clank (gears, pipes etc)
 - Paper page turn (picking up lore pages)
 - Thud when boxes are moved
 - Fixing Machine
 - Gears turning when machine built
 - Metal clang when gear is placed
 - Steam
 - Clockwork noises
- **Environment):** Birds, jungle sounds, crickets, creaks
 - Metal creaks
 - Distant steam pressure releases
 - Machine whirring
 - Water running through pipes
 - Ambient groans of facility
 - Rocks falling when underground

Music



Figure 22: Mood Wheel Revisited- The goal of feeling for the music is to strike a balance between melancholy (Sadness) and anticipatory (Anticipation) tones as this supports the derelict state of the world in addition to the unknown threats of the factory. That said again, music will also need to ramp up in tempo and intensity as the levels progress to give a natural progression of coming face to face with the boss in level 3.

- **Event Jingles:** Success/failure/death/victory/discovery etc.
 - Death Screen jingle, utilized when caught by one of the robots
 - Puzzle complete jingle utilized when you can progress to next level
 - Secret discovery jingle, utilized when you have found a secret area.
- **Shell Screen:** Ominous, Melancholy theme.
- **Level Theme:** Level specific music should maintain a similar aesthetic that builds upon its previous theme. Each level theme should be slightly more intense than previous leading to the boss level.
 - Level 1: Mailroom
 - Level 2: Maintenance Room
 - Level 3: The Heart (Boss)
- **Diegetic In-Game Music:** Collection of lighthearted instrumental songs that contrast against the dark world, highlighting the dichotomy between how the Waterworks was perceived vs its dark underbelly of secrets. These will play within the in-game PA system.
 - 5-10 songs will play on rotation and will be interrupted by in game voice lines by the PA robot.
- **Cinematic Soundtracks:** Will be utilized only in the beginning and end cutscenes. First introduction to the musical aesthetic of the game.
 - Beginning Cutscene

- End Cutscene

Game Audio Library

Audio Library can be accessed through the google drive link below.

<https://drive.google.com/drive/folders/1zjbx8Y9f19W7ukDZB3m2O8hnSImxOThr?usp=sharing>

Signatures verifying agreement:

Atilla Istami

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Stephan Ozan

Appendix F: Technology Development Plan Details

Product Specifications

Scope

Steamwell will be created using Unreal engine. The game will feature 3 main levels that will progress linearly as each puzzle is completed in the respective zone. The game world consists of the player traversing down into the underground depths of the factory, each level having a progressively more difficult puzzle than the last. Alongside the linear level progression, a narrative will be told alongside the puzzles through environmental storytelling, voice lines and lore tabs.

End Product

The overall project will consist of 3 levels within the Steam factory, each with a unique puzzle mechanic. Within each level there will be notes that contain lore bits to discover and possibly provide hints to the puzzle. Although still in conceptual phases, we plan to have 2-3 enemies that will hinder the players progress in the levels. The end product will be listed below.

Game

- 3 Total levels WITH unique mechanics
- 2-3 enemies to interact with
- 3 unique environments within the steam factory
- 10-14 minutes of gameplay
- Many lore notes to discover

System Requirements

In order to play the game, the player will need a PC, MAC, or VR with the necessary periphery including but not limited to a Display, Mouse/Mousepad and Keyboard. The necessary minimum and recommended specs to run the game are listed below based on the target platforms.

Target Computer Systems

Minimum

Processor: Intel CPU i3
Memory: 4 GB RAM
Video Card: Nvidia GTX 460
Operating System: Requires 64 bit processor and operating system.
DirectX: Version 11
Additional Notes: SSE4.2 required

Recommended:

Processor: Intel CPU Core i7
Memory: 8 GB RAM
Video Card: Nvidia GPU GeForce GTX 660
Operating System: Requires 64-bit processor and operating system
DirectX: Version 11
Additional Notes: SSE4.2 required

Target Mobile Systems

Model: VR Oculus
Memory: 4 GB
Operating System: AOSP

Resource Budget

Assets Budgets Estimate

Total Asset Budget - \$18,000 (2 Members)

Low Poly art Style allows for much faster development of assets that can be done in a stylized and quality fashion that supports the games aesthetic and gameplay. Limitations among the engine are also substantially decreased as low poly models, and its low resolution textures are not impactful to game performance and the import process.

Technology Sources Acquired

Art Creation

Procreate - Concept Art/Texturing
Blender - Modeling/Texturing

Photoshop - Concept Art

Development Platforms

Art Development - IPad or PC

Programming - PC

Audio - PC

Narrative - PC, IPad, Mobile, Journal, Notepad

Game Engine Add-ons

Unreal - Git File Locking

Sound

Premiere Pro - Video and Sound editing software

Software Engineering

Gitlab - Software Version control

Overview of Technologies Utilized

- Unreal Engine - Game Engine
- Premiere Pro - Video and Sound Editing
- Blender - 3D modeling
- Gitlab - Repository and Version Control
- Trello - Task Management
- Procreate - Concept Art
- Photoshop - Concept Art

Risk Assessments

Key Assumptions

- Unreal Engine: Many team members have not had much experience with developing on unreal engine as it is much more complex than Unity or Godot due to its use of binary systems. Over the past several weeks, we have gained much more experience with the engine and how to navigate its environment. Due to this experience, and extensive experience with game engines in the past, we are confident we can keep building our skills in Unreal.
- 3rd Person Narrative: Team members have not created a story driven 3rd person game before at this magnitude. We have had extensive experience in developing games and are driven to find a balance between an engaging narrative and fun mechanics while maintaining a workable scope.

- **Gitlab Tools:** Some developers have not had much experience in Gitlab as they have with GitHub. Gitlab was utilized due to their higher availability in storage due to the much larger file sizes of Unreal. Although it's a bit different than GitHub, many of the processes are the same but with different execution on Gitlab and are becoming easier to use with experience.

Development Risks

Merge Conflicts

Brief Description: Merge conflicts are, and will occur, during the merging of development branches.

Impact: This risk will severely halt development if not handled carefully as features can be lost and branches can be corrupted.

Probability: Very high probability due to the amount of people working on the project.

Visibility: We have discussed a pipeline for merging features so when this occurs we will know exactly when it took place.

Mitigation: We always have a backup of the game in order to revert back to, and have developed a pipeline to identify where a branch was corrupted or lost.

Breaking Pipeline

Brief Description: This occurs when we have a plan for subteams to develop a feature or asset needed in order for other team mates to begin development. For example, programmers need a boss model in order to begin programming.

Impact: This can be a major problem for development if needed features are not completed in a timely manner in time for the requirements of the current sprint.

Probability: As the team gets busier during the semester, this will naturally occur.

Visibility: Mitigation: Communicate the timeline of a feature in a timely manner so that others may adapt or work on other features in the meantime.

Enemy AI

Brief Description: Building out multiple enemy AI to ensure the game doesn't break or mechanics are not contradicting its pathfinding.

Impact: The enemy AI has a very big impact on the game as the puzzles within a level have the potential to be broken if the enemy AI causes a crash or discrepancy.

Probability: In the testing stages it is likely this problem will occur.

Visibility: Mitigation: Test and test often with different scenarios to ensure the enemy AI will function correctly and when a problem arises, fix it immediately and ensure other parts of code are not affected.

Software Configuration Management

Naming Convention

C++ files and Blueprint files must be prefixed with SV_. Blueprints also need to have BP_ at the front. Other Blueprint files that are not children of a C++ class

Category/File Formats

File Format	Naming Convention
.cpp	SV_FileName
.h	SV_FileName
Blueprint	BP_SV_FileName
Data Asset	FileName_DA
Widget	FileName_WB

Build Plan

Assets will be frozen on Tuesday, 11:59 PM, and a build of the game will also be built. The code will be frozen at Wednesday, 10AM, and the final build will be built at 12PM, so that testing will run until 4PM. If there is a major bug in the latest branch, then yesterday's build will be used instead. If that build is also compromised, then the last build before that will be used. Builds are created every 2 days at midnight, after all of the feature branches have been merged. Stephen is the build master that coordinates the builds of the game.

Coding Standards

- Always place a new file in a fitting folder
- Try to create a base class for objects that have similar functionality. Try to think abstractly as to what basic features does the item you want to implement have.
- Make a commit every time progress has been made and the code compiles and the code changed in the commit does the correct behavior
- Every midnight, each developer will push their commits and merge it onto the “develop” branch, then pull/merge the develop branch back to their own branches.
- Every other day, make a build of the game (at least Windows) after the merging.
- When attempting to edit a binary/.uasset file, do the following procedure to ensure that there are no merge conflicts
 - Switch to the develop branch and git pull
 - Merge the develop branch onto your branch

- Lock the .uasset file using git lfs lock <filename> or by using the GUI app
- Make your changes to the .uasset file
- Commit changes
- Push to your branch
- Unlock the file and **immediately** merge onto develop (gitlab won't let you merge with a locked file)

Integration Testing

Playtesting Dates: Wednesday and Sunday

Wednesday Playtest

- 6PM GDC Atrium 3rd floor
- Test Windows build, Mac build, and VR build.
- Run through checklist of requirements that was curated during the course of the sprint
- More focus on the design, assets, and aesthetic

Sunday Playtest

- 3PM GDC 2nd Floor Lab
- Test primarily Windows build
- Run through checklist of requirements that was curated during the course of the sprint
- Mainly focused on functionality and programming.

Quality Assurance

Maxmillion will be the person in charge of quality assurance and will create bug reports and workflow improvements. Maxmillion will run the build of the game, usually in conjunction with either Joy or Stephen, to find bugs in the game and create a report out of them. At the end of each sprint, we will review what went wrong or right with our organization and architecture and revise our coding standards.

Signatures verifying agreement:

Atilla Istami

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Lila Mali

Maxmillion Maldonado

Patrice Hayes

Stephan Ozan