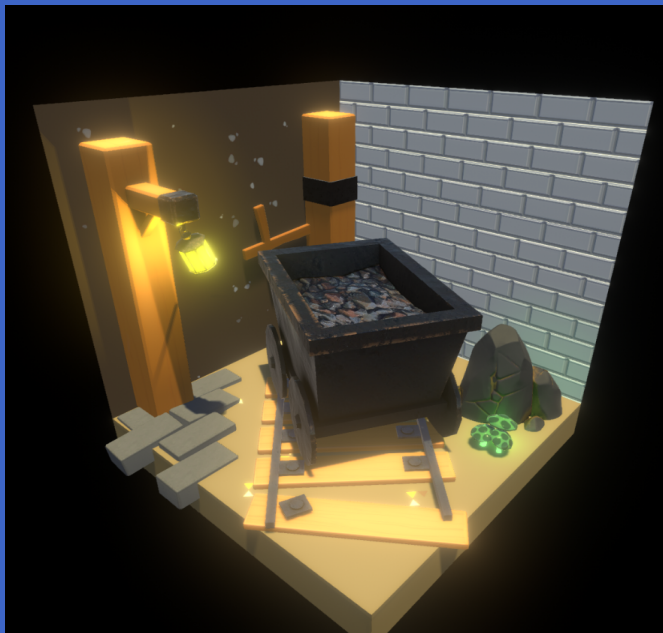




MAGNETISM

Game Design Document



By .Slerp Studios



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Developed in Canada





Revision History

Revision #	Date	Author	Changes
1	Feb 5	Jaylin Grierson	Created template for document, filled headers and title page, formatted headings and text sizes and colours, set up table of contents, and set up revision history.
2	Feb 5	Jaylin Grierson	Filled out market analysis, target demographic, sales comparison and localization plan (1.6, 1.6.1)
3	Feb 5	Hongming Wang	Completed 1.8-1.10(Project risks, Monetization, User Documentation)
4	Feb 7th	Martin Gallagher	Worked on Project Vision, Core Game Concepts (to add more later i.e art), Genre and Play time. Adjusted font sizes to be more uniform (all main titles pt 16, subtitles pt 14, etc.)
5	Feb 8th	Jaylin Grierson	Filled out project scope section, refined market analysis (1.7, 1.7.1-1.7.3)
6	Feb 11th	Jana Panem	Filled out Sections 2.1 - 2.4
7	Feb 11th	Martin Gallagher	Blocked in section 1.4. Block in Art Direction/built tables for subsections of Art Direction. Standardize numbering of tables in document. Concept art place holders.
8	Feb 11th	Daniel Fraser	Filled out sections 2.5 - 2.6
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10	Feb 13th	Jana Panem	Changed the Document theming based on feedback and to better reflect the game.
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12	Feb 17th	Martin Gallagher	Finished Genre Section. Formatted Tables. Added to Art Direction.
13	Feb 18th	Jaylin Grierson	Updated scope to reference new art direction. Added scope summary for prototype versus full game. Updated technical requirements. Fully formatted document for submission. (1.6)





14	Feb 21	Jaylin Grerson	Added headers for sections 3-4. Roughed out boss descriptions, listed objects and items for sections 4.1.2-4.1.3
15	Feb 21	Daniel Fraser	Filled out Default Controller Layout & Player Character (sections 3.1.1 and 3.2 respectively)
16	Feb 22	Jaylin Grierson	Elaborated on bosses, filled out the camera section. (3.6, 4.5)
17	Feb 23	Hongming Wang	Filled out sections 3.3, 3.3.1, 3.7, 4.1.1, and 4.6.
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19	Feb 25	Martin Gallagher	Added figure numbers/reference to images in text. Worked on sections 3.5, 4.2, and 4.7 and roughed in information for 4.8 and 4.3.
20	Feb 25	Jana Panem	Filled in Sections 3.1.2, 3.4, and 4.4
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22	Mar 16	Jaylin Grierson	Added scale to objects, updated boss behaviour design. (4.1.2, 4.1.3, 4.5)
23	Mar 19	Martin Gallagher	Added sketches to Level's Breakdown chart, added final levels, and added Beat Map chart link
24	Mar 20	Martin Gallagher	Added more to the Level Breakdown table, finished beat map, switched placement of Missions and Game map to allow more room for game map/better document flow.
25	Mar 23	Martin Gallagher	Added Game Map section, finished Level breakdown table, added colour pallets to beat map
26	Mar 25	Jaylin Grierson	Formatted document for submission
27	Mar 30	Jaylin Grierson	Added character and object special effects section. (7.1, 7.2)
28	Mar 30	Daniel Fraser	Filled out 5.1 and 5.2 (Collectibles HUD & Health Bar HUD)
29	Mar 31	Jana Panem	Filled out 8.0 (8.1, 8.2, and 8.3)





30	Mar 31	Martin Gallagher	Worked on Menu section/ 6.0 (6.1,6.2 and 6.3)
31	Mar 31	Hongming Wang	Filled out environment special effects.
32	Apr 8	Jaylin Grierson	Edited effects section and formatted document for submission.





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1. Project Summary

1.1. Project Vision

Magnetism is a game focused on creating thought provoking puzzle solving with an “easy on the eyes” 3D aesthetic. Our vision for this project is that creating it will be as fun, yet challenging, as we hope the end game will be. As this will be the first larger project in 3D, we expect there to be a great opportunity to learn from each other and really think about our design from all angles. Delving into the underground world, rich in metals and gems, the players will have plenty of items to move around to solve each puzzle. Inside *Magnetism* is a world of mining. Armed with their magnet gun, they will venture into great depths, finding fun solutions and shiny collectibles along the way.

The masterful blend of charming assets and a system of magnets designed to give the players an innovative control over their environment is sure to win over the hearts of gamers. With a *positive* attitude, and a common *attraction* to the theme amongst the team, we aim to put the play back into puzzle games.

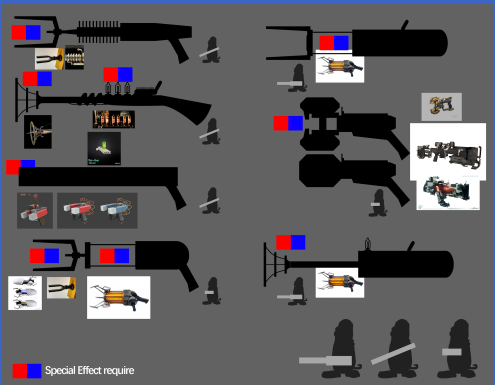
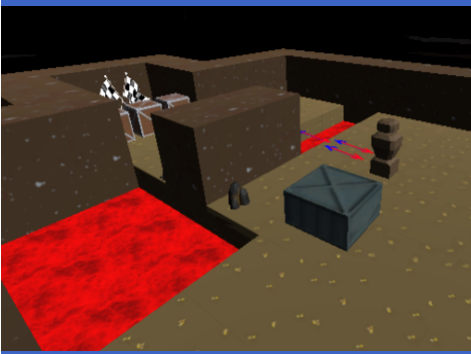
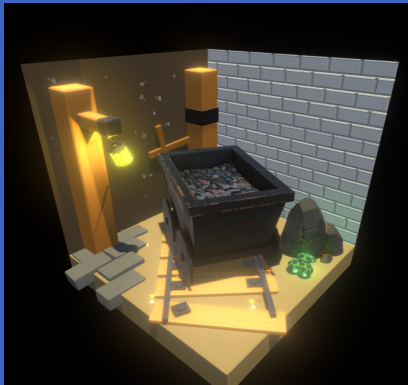




1.1.1. Core Game Concepts

Magnetism, in terms of mechanics and logistics, can be seen as a fairly simple game that is pleasing on the eyes and fun to play. At its core, the game can be broken down into 3 main concepts (see Table 1 below).

Table 1: CORE GAME CONCEPTS

Magnet Gun	Puzzle Solving	Intriguing Theme
<p>As the player sets off on their great journey into the mine caves they will not have to brave the cold, creepy world alone! The magnet gun (<i>Fig 1.</i>) will accompany them and will give players the power and confidence to manipulate their surroundings! Taking inspiration from Portal, this fascinating tool contains great power and will be the primary source of interaction for our players. That being said, it won't solve the puzzles for you.</p>	<p>While the magnet gun is very fascinating, it has a job to do, and so do you! Players are to traverse the mines and solve puzzles to continue. They will start off easy as to get players used to the push and pull of the magnet gun. After the initial 3-4 levels, the difficulty will work up to being more complex. By the end, the levels will incorporate more and more components at play; this will surely challenge our players and designers. See below in <i>Fig. 2</i> for a reference to the puzzles involved.</p>	<p>Taking place in an underground world, there is great potential for metallic/magnetic items to naturally be found in this environment. Not to mention, this is a theme/setting that is not fairly common but has been successful (<i>Minecraft</i>). See <i>Fig. 3</i> for an example of the art/theme we are aiming for. And see <i>Fig 6 and 7</i> for our direction in stylization for this theme.</p>
 <p><i>Fig. 1</i> Template/Concepts for Magnet Gun</p>	 <p><i>Fig. 2</i> Semi-arted Level</p>	 <p><i>Fig. 3</i> Concept Environment turntable</p>



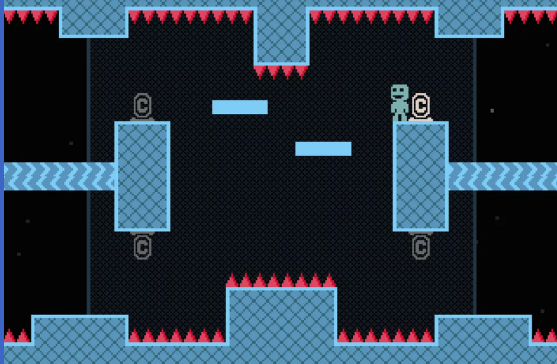



1.2. Genre

Magnetism is a combination of Puzzle Platforming, with elements of Action-Adventure. Players will defend themselves by manipulating their surroundings with their trusty Magnet Gun. Taking inspiration from games like the Legend of Zelda (series, see fig. 5), Portal 1 (2007) & 2 (2011), and VVVVVV (2010, see fig. 4), we hope to put a new spin on the classic puzzle platformers.

Below, in Table 2, we will break down exactly which elements of these combined genres *Magnetism* will utilize in the game.

Table 2: GENRE BREAKDOWN

Puzzle Platforming	Action Adventure
<p>Magnetism will incorporate the following elements of Puzzle Platform games:</p> <p>Experimentation i.e. trying different tactics/solutions for each level) (fig 4)</p> <p>Solving Puzzles/Levels</p> <p>Building Complexity using the teach,test challenge methodology</p> <p>Player will also have 8-directional movement controls</p>	<p>Magnetism will incorporate the following elements of Action Adventure games:</p> <p>Enemies, both being one hit one kill, to minimize on the need for a combat system</p> <p>Gems will be found scattered around the levels to entice and challenge the players (fig 5)</p> <p>Gem/collectible inventory, similar to gems in Spyro and Legend of Zelda Windwaker</p>
 <p>Fig. 4 Screenshot of VVVVVV, a puzzle platformer game</p>	 <p>Fig. 5 Image of Legend of Zelda screenshot debuting enemies, gem counter/inventory in the corner</p>





1.3. Play Time

The prototype will have an average playthrough time of approximately 30 minutes to an 1 hour, including bonus unlockables.

We hope a full game can sustain 10-15 hours worth of gameplay. And with the limited lore, we are able to dispatch DLC over time which will consist of an additional 5 hours of gameplay per patch.

1.4. Target Platform

Magnetism is designed to be played on the PC and will be released via digital distribution on Steam.

1.4.1. Game Engine

Magnetism will be created using the Unity engine (version 2019.4.9f1) as well as some shaders/tile mapping systems created by the team.

1.4.2. System Requirements

Magnetism's charming, simplistic art style and limited textures will allow for systems with older processors and graphic cards to run it without issue.

The recommended specs for the PC are: Windows 7-64 bit or later, Intel i5-650 / AMD A10-5800k CPU or newer, and Nvidia GeForce GTX 650 / Radeon HD 7510 GPU or newer.

1.4.3. Game Format

Magnetism's first patch will originally release on Steam with possible further releases as part of bundles via Humble/Itch.io. Depending on popularity/game sales, future worlds/DLC will be considered for release on Steam.

1.5. Art Direction

For Magnetism, our art direction is driven mainly by our environment/theme (see Table 4) of being in a mine, but also gathers some inspiration from simplistic 3D games (see Table 3). Incorporated in that direction are key objects/play pieces that players will interact with in the game (see Table 5), these are vital for the art direction because they will be seen so often in the game, we want to ensure they are given proper priority so the environment/objects are always exciting. And finally we have our characters, for our prototype we will only have two categories of characters; the Playable character (see Table 6) and Enemies (see Table 7). The enemies consist of one metallic and one non metallic creature as well as the boss.





1.5.1 Inspirations

Table 3: ART DIRECTION-INSPIRATIONS

Overcooked 2	Stardew Valley
	
<p>Aspects of inspiration: 3D assets, skewed top-down perspective, simple stylizations</p>	<p>Aspects of inspiration: lighting, theme (underground) blocking out background</p>

1.5.2 Environment

Table 4: ART DIRECTION-ENVIRONMENT

The Mines	Specialty Floors	Lighting
		
<p>Dirt, stone, minecart tracks and the odd Mine-Sweeper bot, the overall direction will be to capture a mine/cave while still using minimal textures and simplistic assets to not overwhelm the players and give off a more lighthearted feel.</p>	<p>Mines/Caves are not exactly well known for their safe flooring. There will be shafts/holes and pits of lavas will have to avoid/find ways to move around.</p>	<p>Mainly lit from hanging lanterns, work lights and the odd cluster of luminescent mushrooms. This lighting will help build the cool, but safe feel for the players</p>





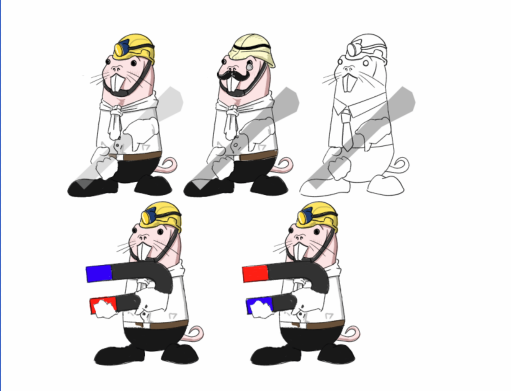
1.5.3 Objects

Table 5: ART DIRECTION-OBJECTS

Magnet Gun	Mine Cart	Magnetic Objects	Collectibles
			
<p>The sole “weapon”/tool of the game. Players will mainly see the top and side views of the magnet gun in playmode</p>	<p>Introduced in later levels, increases difficulty. Can be attracted/repelled by the player.</p>	<p>Objects that are affected by the Magnet gun. This is magnetic rock that is found in most levels.</p>	<p>Used to entice players Collectibles will be gems made in 3D software based off of concepts above.</p>

1.5.4 Characters

Table 6: ART DIRECTION-CHARACTERS



Main Character Concept	Name-Magnus
 <p><i>Fig. 6 Concept sketches of the playable character</i></p>	<p>Made up of simple material, this character has just the right amount of detail to be charming and memorable but easy to model/animate. See <i>Fig. 6</i> for reference of what we will be basing our model off of. Players will easily warm up to Magnus the Naked Mole Rat Miner with his charming figure and cute clothes!</p>





1.5.5 Enemies

Table 7: ART DIRECTION-ENEMIES

Magnetic Based Enemies	Non-Magnetic Enemies
	
<p>A maintenance robot in the mines, they can be attracted or repelled. These do damage to the player. Players can use their surroundings and move the mine-sweepers out of their way/into harm's way to defeat them.</p>	<p>These little buggers are mainly to force players to think outside of the box in order to solve the puzzle. They do damage on contact and are unaffected by the Magnet Gun.</p>

1.6. Project Scope

The game functions around 2 basic mechanics; Movement and magnet forces. The rest of the game interacts systemically with the magnet forces for gameplay. The prototype will have 1 world (or mineshaft) with 15 puzzle levels. The final game will have 10 worlds with 15-20 puzzle levels each. (Table 9). There are 3 characters (Table 8), 7 enemies (Table 10), 5 bosses (Table 11), and 20 objects (Table 12) in the full game. The prototype will function on a reduced scope of 1 character (Table 8), 4 enemies (Table 10), 1 boss (Table 11), and 11 objects (Table 12)

1.6.1. Preliminary List of Game Characters, Levels, and Objects

Table 8: CHARACTER LIST

Characters	Prototype	Full Game
Main Character, Magnus (Table 6)	✓	✓
Miner	✗	✓
Underground Dweller	✗	✓





Table 9: LEVEL LIST

Levels	Prototype	Full Game
Level 1	✓	✓
Level 2	✗	✓
Level 3	✗	✓
Level 4	✗	✓
Level 5	✗	✓

Levels	Prototype	Full Game
Level 6	✗	✓
Level 7	✗	✓
Level 8	✗	✓
Level 9	✗	✓
Level 10	✗	✓

Table 10: ENEMY LIST

Enemies	Prototype	Full Game
Mine-Sweeper (Table 7) - Wanders. Can be attracted/repelled.	✗	✓
Slime (Table 7) - Cannot be attracted or repelled. Wanders.	✗	✓
Miner Bot - Chases player. Can be attracted or repelled.	✓	✓
Ghost - Chases player. Cannot be attracted or repelled.	✓	✓
Armour-dillo - Wanders. Armour can be pulled off to damage.	✗	✓
Bat - Flies over lava	✗	✓
Drone - Flies, but can be attracted or repelled	✗	✓

Table 11: BOSSES

Bosses	Prototype	Full Game
Dragon - Boss 1 (Details in table 16)	✓	✓
Mega Drill - Boss 2 (Details in table 16)	✗	✓
Meta Dragon - Boss 3 (Details in table 16)	✗	✓
Lava Serpent - Boss 4 (Details in table 16)	✗	✓
The Shadow - Boss 5 (Details in table 16)	✗	✓





Table 12: OBJECT LIST

Objects	Prototype	Full Game
Wood Crate	✓	✓
Metal Crate	✓	✓
Rock	✓	✓
Metal Ore (Table 5)	✓	✓
Crystal	✓	✓
Torch	✗	✓
Glow Mushroom	✓	✓
Lantern	✓	✓
Mine Cart (Table 5)	✓	✓
Mine Cart Track	✓	✓

Objects	Prototype	Full Game
Chest	✓	✓
Bricks	✗	✓
Wood Beam	✗	✓
Lava	✓	✓
Ladder	✗	✓
Stairs	✗	✓
Debris	✗	✓
Storage Bin	✗	✓
Skeleton	✗	✓
Bulldozer	✗	✓

1.7. Market Analysis

1.7.1. Target Demographics

Our target demographic is fans of puzzle games who enjoy a relaxed and thoughtful experience. We are targeting the same players who would play 2D Zelda games such as Oracle of Seasons and Link's Awakening (Fig 7), puzzle games such as Wilmot's Warehouse, or physical puzzle games such as Rush Hour.

The age rating of our game will be Everyone 10 and up (E10+), but the puzzle difficulty will be high enough for adult fans to enjoy the game as well.

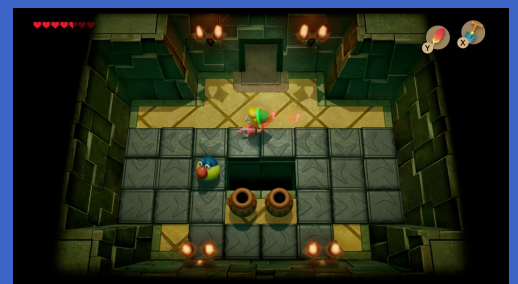


Fig 7: Link's Awakening (2019)





1.7.2. Sales Comparison

We have three categories of proxy games to estimate our sales numbers (Table 13). First is the gameboy zelda games which have a similar top-down puzzle style selling approximately 4 million copies. Realistic is puzzle indie games selling approximately 300,000 copies. Finally is the pessimistic sales of a puzzle indie game at 20,000 copies.

Table 13: PROXIES

Optimistic	Realistic	Pessimistic
Oracle of Ages/Seasons (3.96 million) - Gameboy - AAA	Cogs (380,000) - PC - Indie	Wilmot's Warehouse (20,000) - PC - Indie
Link's Awakening (4.2 million) - Gameboy - AAA	Baba Is You (Estimated 200,000) - PC - Indie	

Optimistic sales = 4 million copies

Realistic sales = 300,000 copies

Pessimistic sales = 20,000 copies

1.7.3. Localization Plan

We plan on selling our game in North America, Europe and Japan.

The game will be translated from English into Japanese, Spanish, French, Russian, and German (Fig 8). French and Spanish were chosen since they are the most spoken languages in North America. Russian and German were chosen since they are the most spoken languages in Europe. This way we can reach as large an audience as possible without translating into too many languages.

We feel the Japanese market is worth it since other puzzle focused games such as the 2d Zelda games sell approximately 10% of their total copies in Japan.



Fig 8: Localization Languages

1.8. Project Risks

Table 14 contains a full list of our project's potential risks and the preventative actions taken to minimize them. Red means highest priority, yellow means medium priority, and green means lowest priority.





Table 14: RISKS AND PREVENTIVE ACTIONS

Category	Source	Possible Risk Description	Preventive Actions	Impact Level	Probability Level	Priority Level
Market	Theme	Potential consumer dissatisfaction risks caused by non-trending theme	Ensure continuous market research and prepare different market strategies in advance.	4	1	4
Market	Sale	The release schedule conflicts with similar games	Conduct market research in advance to ensure information about other potential competitors	4	1	4
Development	QA	A large number of unknown bugs caused by lack of QA	Guarantee and value the work of QA throughout the development process	4	2	8
Development	Program ming	Work delays caused by urgent bug fixes	Work priority adjustment. As much as possible to ensure the flexibility and necessity of everyone's work.	4	3	12
Development	Game Design	The development time is not enough to support the content of the design.	In the design stage, ensure everyone's participation and communication to propose a design plan that meets the team's conditions. Strengthen the supervision of progress control during the development phase.	5	3	15
Development	Program ming,Art	The unsatisfactory process of work transition led to rework of works.	Communicate as early and transparently as possible.	3	3	9
Development	Art	Lack of resources and time caused by later development	Create a detailed list of required Assets. The development should be as flexible as possible for content creation.	2	3	6
Development	Project Develop ment	Development progress is not up to expectations	The team needs to flexibly arrange schedule to accommodate remaining development time.	5	5	25





Development	Game Design, Art	The unsatisfactory process of work transition led to rework of works.	Communicate as early and transparently as possible. The design team should also put forward requirements based on actual conditions.	2	2	4
Development	Level Design	The requirements proposed by the level designer are told by the development team that they cannot be fulfilled	Communicate and adjust the levels of existing games in time. Provide a backup plan as early as possible.	4	2	8
Development	Project Development	Team members quarreled with each other, which delayed the development plan	Seek solutions to problems without affecting project development and cooperation	1	1	1

1.9. Monetization

1.9.1 Initial Price

Our price for our game is **15.99 CAD**. As an indie puzzle game, it is a suitable price for our target market. The relatively average price guarantees the subsequent development and revenue of the game while ensuring that our target users of all ages can afford it.

1.9.2 Subsequent development and late-stage revenue

After the game is completed, the development team plans to use part of the revenue to carry out subsequent development. During this period, the development team will invest and develop DLC and Merchandise.

1.10. User Documentation

The game will provide an **in-game Instruction Manual**. While providing the Instruction Manual, it will also provide related in-game tutorial levels to help players better understand the game. The Instruction Manual will provide players with the following information;

- Introduction and explanation of game mechanics
- Game control
- Map
- Collectible story log
- Collectible In-game encyclopedia





2. Game Story Overview

2.1. Story Genre

The story of Magnetism will be linear.

2.2. License Considerations

Magnetism will have its own cast of original characters, so there will be no need for permission from other companies or franchises when it comes to using established characters.

2.3. Story Overview/Synopsis

Play as an ambitious miner whose main goal is to retrieve a treasure hidden beneath the earth's surface. Many have tried to retrieve the treasure, but have been consumed by greed and never escaped the mineshaft alive. The miner isn't the only one pursuing the treasure, and they are bound to come across others who may want the treasure for themselves. But it isn't just other miners to watch out for, the underground dwellers are territorial and possessive of their treasure. Unlike all the other treasure hunters however, The miner has their own special weapon: The Magnet gun, a gun capable of repelling or attracting metallic objects and precious metals.

2.4. Story Progression Overview

2.4.1. Setting

"Magnetism" takes place entirely underground. Each level reflects how deep the players are in the mine, and the deeper they go, the more dangerous it gets but the more gemstones can be found. As for the time period, Magnetism will take place in the present.

2.4.2 Player Character Story Arc

The miner starts off like all the other Treasure hunters, selfish and initially only concerned about retrieving the treasure by any means. However, as players progress through the levels, the miner slowly reflects on themselves and becomes more aware of others as they encounter other miners that descend the mineshaft. The more players seek out hidden areas where other miners may have gotten lost, the more the player miner grows as a person. By seeking out hidden areas and completing puzzles to find other miners and help them find a way out, The player miner becomes more selfless.





2.4.3. Cutscenes

There will be a few cutscenes to give players an idea how far in the story they are, and to give context on what the miner is going through in the current level. They will most likely be short, and may only play before the level starts, or after the level is completed.

2.4.3.1 Cutscene Production

The cutscenes will all be made in-game using Unity Engine in-house. No additional third party plugins or Unity add-ons will be needed.

2.4.3.2 Describe game area

Levels are made up of a wall, floor, hazard, interactables, agents, and props.

- Walls act as a border to contain the player within the level.
- Floors are a space players can move around in freely.
- Hazards either harm the player by inflicting damage or instantly kill them if touched.
- Interactables are blocks players can use their magnet gun on or push around.
- Agents could be enemies or NPC's that run on AI or navmesh and have a predictable pattern.
- Props are background objects that are just there for lighting or decoration to set the level's mood.

2.4.3.3 General description

Since the setting is an underground mineshaft, expect to be surrounded by rock or dirt walls the entire game. Crystals and gems can also be seen on these walls, the more you descend, the more crystals and gems you're surrounded with. On the later levels, expect to find large pools of lava which you may need to jump or hover over using your magnet gun.





2.5. Backstory

A long standing and mysterious mineshaft lays unexplored for many years...

A tall tale of promised riches laying at its core, many miners have tried to find the treasures and have not returned from its depths. Though it had laid closed for decades due to the disappearances of miners, news has broken out that one miner has escaped with an unbelievable diamond in his possession. Believing the tall tale to be confirmed, many individuals and corporations raid the mineshaft once more to seek the mountains of riches promised by the surprise miracle survivor. It is later revealed that the miracle survivor is an actor playing the part of a fake survivor who wished to revive the mineshaft search. The actor believes that if the mineshaft search is resumed, his greedy mining company will be able to either find the treasure themselves or capture the first person who does. The player, equipped with a mysterious magnet gun passed down for generations in their family of miners, goes to the mineshaft to pursue the same riches, initially wanting to keep it for their own selfish desires.

2.6. Game Character Descriptions/Bios. NPCs, Player, Enemies.

The Player (AKA Magnus)

The player character is Magnus who possesses a special weapon known as the “Magnet gun”, passed down for generations in their miner family. Notably selfish at the start of the game, this miner becomes more aware of the other miners who have trekked through the treacherous mineshaft and is more selfless than they let on.

Enemies (Other Miners/Treasure hunters)

Other miners competing for the treasure. Whether they come for personal riches or sent on behalf of their company, they are all competing for the promised treasures at the bottom of the perilous mineshaft.

Underground Dwellers

Territorial and Possessive Monsters that live below the surface. Long have they dwelled in the mineshaft, former miners who had sought the treasure for themselves. They had first lost their way through the mine; but now, they have lost their minds, entranced by the treasure they have yet to find. Those that were lucky enough to find precious materials hid away in the mine shaft, their minds already warped, willing to fight those who would dare take their treasure away from them.





3.0 Game Mechanics

3.1 Player Controls

3.1.1 Default Controller Layout

Fig 9 shows the default controller layout for Magnetism.

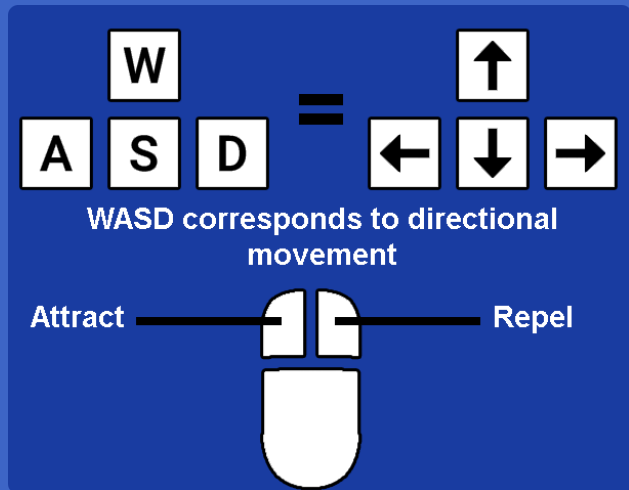


Fig. 9 Controller Layout Infographic

3.1.2 Force Feedback/VR Feedback/Tilting/Motion Sensing/etc.

All feedback will be seen or heard in game. To show players are using the magnet gun, two particle systems were made to show which mode the players are currently using. Both particles have similar properties but have different textures. Their textures correspond to pushing or pulling. Both particle systems have a horizontal billboard rendering mode, custom materials, and are prewarmed. The positive particle spreads out in a box shape, while the negative particle spreads out in a cone shape. Another main difference is that the positive particle scrolls towards the player (to show “pulling”), while the negative particle scrolls away from the player (to show “pushing”). The particles are enabled when the player right-clicks/left-clicks, then disabled when the mouse buttons are let go.





3.2 Player Character

The player controls “Magnus” and his magnet weapon during gameplay. The player can move with the use of WASD for 8-directional movement, using W and S to move forward and backward in the world. S and D will move the player left and right. The player will rotate instantly as they move. To use the magnet, players will use the mouse buttons. Left mouse button for attract and right mouse button for repel. Attracting and repelling movable objects & enemies will move the entity towards or away from the player. Using these against stationary objects will attract or repel the player to/from the object.

3.3 Game World

Magnetism takes place in a distinct game world with specific visual elements relating to mines and the underground (Table 15)

Table 15: GAME SETTING

Game world setting	Visual elements
<p>The time of the game is set between the modern or industrial era. As in the industrial age, people have more demands because of the advancement of technology. The rapid development of industry has provided a strong and excellent material foundation, and more and more ordinary people have begun to explore outwards in order to obtain more wealth. These treasure hunters are frequent visitors to mines and underground. They live underground for many years in an attempt to discover a large number of treasures and wealth that no one has discovered. Abandoned mine pits and underground are uninhabited, and some incomprehensible creatures have occupied these places. But the temptation of treasure and wealth makes treasure hunters temporarily forget the dangers of underground and mines.</p>	<ul style="list-style-type: none">-Caves, mines, underground environment-Objects like minecarts and railways that can visually tell player the underground caves or mines environment-Objects like stone, ore and mushroom that can visually tell player the cave environment-Indirect light on environment objects like lamp or mushroom-Environment animations(optional)





3.3.1 Game Environment

The game’s environment focuses on a combination of environmental setpieces and lighting to achieve its aesthetic (Table 16)

Table 16: GAME ENVIRONMENT

Game Environment	Description	Picture
<p>Lighting</p>	<p>The game will focus on shaping the dark and dirty underground environment. We decide to provide relatively dark global light for each level, and then provide local light or Indirect light for lighting objects such as lamps or mushrooms in specific areas</p>	
<p>Environment Objects</p>	<p>In order to visually inform the player that the game is happening underground caves and mines, we have made many environment objects that can express the current environment, such as mine carts, railways, wooden supports, and bricks.</p>	

3.4 Combat

Magnetism will feature a puzzle-oriented approach to combat as opposed to traditional melee combat. Combat is less about how much damage the player can inflict, and more about puzzle solving, finding ways for players to defeat enemies without directly hitting them with your weapon. Magnetism will feature different kinds of enemies (magnetic and non-magnetic) to encourage creativity. Bosses are more advanced tests of the player’s skills and knowledge of the mechanics. Bosses will provide a challenge more in depth than enemies found in levels and usually have a room solely dedicated to the boss encounter.





3.4.1 Combat Details

Since the player's only weapon is the Magnet gun, What players can do in a level depends on the level's environment.

Magnet gun range

The magnet gun's range is infinite, but is 1 block wide. The magnet gun affects the first metallic object it detects within range. The magnet gun cannot attract the magnetic object if there is a wall or non-magnetic object in front of it.

Using other objects

Players can use objects in the environment (metal crates and minecarts) and have those items crush enemies into walls or squish them into another object. Players can also trigger pressure plates to move walls or cause a trap to activate to eliminate enemies.

Using the magnetic force on enemies

Some enemies are metallic themselves (ghost lamps) and can be pushed/pulled by your magnet gun directly. Players can use this to their advantage by pushing or pulling them to a hazard tile (lava, pit).

Pitting other enemies against each other

In some cases, levels may not contain crates. In this case Players can force two magnetic enemies to collide into each other. Enemies have only one life, making any hit fatal to them.

Player Damage

The player takes damage upon collision with enemies, lava, or fire. They can take 3 hits before being defeated.





3.5 Puzzles

Each level of gameplay is a puzzle for the player to solve to gain access to the next part of the mine. Players will continue to progress through the caves, mastering Magnus' capabilities until they are faced with the final level/boss.

All levels contain a varying mix of the following gameplay objects/mechanics used to solve puzzles and get to the next door/checkpoint:

- Metal objects that can be pulled/pushed from the player using the magnet gun
- Metal objects that pull/push the player via the magnet gun
- Movable objects that can fall into holes/pits of lava and be used as bridges
- Movable objects that respawn when they fall into lava/pits
- Areas like pitfalls or lava that kill the player/restarts the level
- Gems that motivate players to challenge themselves
- Magnetic enemies that block your path/force you to take other routes
- Non-magnetic enemies that block your path/ force players to take other routes
- Mine carts on tracks that need to be moved (sometimes in specific orders) to get to the goal
- Pressure plates that require players to move objects on top of them to continue

To solve each puzzle, players must manipulate their surroundings to reach the checkpoint.

Some solutions include:

- Utilizing magnetic objects to build bridges/paths
- Utilizing big magnet objects to pull yourself over danger zones (lava and pitfalls)
- Pushing/Pulling magnetic enemies into danger zones
- Loring non magnetic enemies into areas that can't escape
- Moving magnetic objects onto pressure plates to unlock doors

Or any combination of the above.

For example, the puzzle in table 17 could be solved in a number of ways. More information on specific puzzle designs and possible solutions are found in section 4.2, Table 23.





Table 17: EXAMPLE PUZZLE

Puzzle Solution	Diagram
<ol style="list-style-type: none">1. Using the attract (left mouse) button to attract yourself (orange square) over the first danger zone utilizing the big magnetic object (red rectangle)2. Push the movable object (blue rectangle) using the repel (right mouse) button to send it over the pit3. Walk onto the platform you have created4. Using the attract button again, glide safely to the last area using the other big magnetized object5. Move the small object (small blue square) into the pit6. Proceed to the goal (green rectangle)	





3.6 Camera System

The camera is located above and behind the player facing downwards at a 55 degree angle. The camera follows the player from this fixed perspective throughout the level. The camera moves at the same speed as the player. Table 18 shows the camera in the game view and in a side view in the editor.

Table 18: CAMERA PERSPECTIVES

Game View	Side View
	



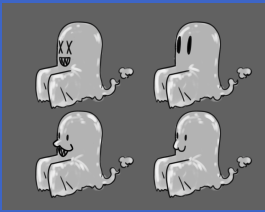


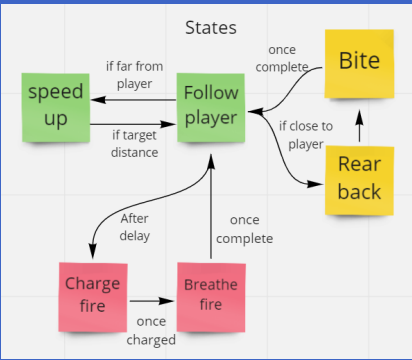




3.7 Artificial Intelligence

The following table (table 19) showcases the AI enemies in the prototype.

Table 19: AI

Enemy	Name	Function	Additional picture
	Lamp	The Enemy Ai is designed on one shared behaviour tree. The primary variable tracked is awareness [FOV]. Enemies are designed with basic wandering state, and will only switch to other states after being attacked or seeing the player.	
	Ghost	<p>Lamp enemies are magnetic and can be pushed or pulled with the player's magnet gun.</p> <p>Ghost enemies are non-magnetic and are immune to the magnet gun.</p> <p>Both enemies can be defeated by hitting them with magnetic objects.</p> <p>State Behaviours: -Wander -Chase player</p>	
	Boss	Boss will be the focus of AI development. We plan to develop an independent level for the boss so that we can have enough room to design a boss AI that is different from ordinary enemies. We plan to provide boss with diverse attack methods and multiple behaviour states. More details about the boss are in section 4.5 table 24.	 <pre> graph TD subgraph States Follow[Follow player] Bite[Bite] Rear[Rear back] Charge[Charge fire] Breathe[Breathe fire] Speed[speed up] end Follow -- "if far from player" --> Speed Follow -- "if target distance" --> Charge Charge -- "once charged" --> Breathe Breathe -- "once complete" --> Follow Follow -- "if close to player" --> Rear Rear --> Bite Bite -- "once complete" --> Follow </pre>





3.8 Others (collectibles, skill tree, points, levelling, etc)

3.8.1 Collectibles

Players can collect rare gems throughout the levels. They are represented in three different forms of gems: Rubies (red), Emeralds (green) and Diamonds (blue). Collectibles will be scattered throughout levels and disappear upon contact, adding to the player's total gems collected tally. If the player collects half of the collectibles in the game they unlock the extra "gym" level option on the main menu. If the player collects all of the collectibles in the game they unlock the extra "art" scene on the main menu.

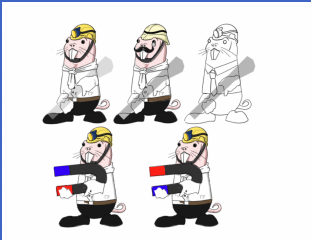
4.0 Game Progression

4.1 Game Elements

4.1.1 Characters

Table 20 contains all the characters featured in the prototype.

Table 20: CHARACTERS

Character	Name	Description
	Magnus	This will be the player's main control object. The magnetic gun will be directly attached to the character's hand. Because the hands and feet are not designed to connect to the body, the subsequent animation work will be very simple for us.







4.1.2 Items

There are two main items which appear in Magnetism: The magnet gun and collectibles (Table 21).

Table 21: ITEMS

Name	Function	Visuals
Magnet Gun	Allows the player to manipulate magnetic objects. Using the magnet gun players can attract or repel various objects and enemies found in-game. The magnet gun is the game's primary item and appears in all levels.	
Collectible	Scattered around the levels, collectibles provide an additional puzzle solving challenge. They have no effect on gameplay, instead unlocking bonus areas (see section 3.8.1).	











4.1.3 Objects/Mechanisms

There are two primary types of objects in Magnetism. The first is magnetic objects which can be attracted and repelled by the player. The second is interactable objects which perform an action when touched by the player or magnetic objects. Table 22 contains the full list of these objects.

Table 22: OBJECTS AND MECHANISMS

Name	Size (Units)	Function	Visuals
Movable Object	0.75 long 0.75 tall 0.75 wide	Movable objects can be attracted or repelled by the player using the magnet gun. Pushing movable objects into other movable objects will cause those objects to move. Movable objects will fall with gravity and sit on lava to create bridges for the player.	
Respawning Object	0.75 long 0.75 tall 0.75 wide	Respawning objects behave the same as movable objects except they respawn at their original location if they touch lava.	
Mine Cart	1 long 0.75 tall 0.75 wide	Mine carts function the same as movable objects except they can only be moved parallel to their tracks. Players can attract or repel the front or back of the cart to move it.	
Stationary object	1 long 1 tall 1 wide	Stationary objects move the player when the magnet gun is used. Attracting the stationary object will move the player towards it while repelling the stationary object will move the player away from it. This can be used to fly over lava and holes in the level.	
Pressure Plate	0.75 long 0.1 tall 0.75 wide	Pressure plates can be activated by being stood on by the player or by having an object placed on them. Once activated they will move their target object to a specified position and once deactivated they will return it to the original position. The target object and location are specified by the level designer in the inspector.	
Goal	0.1 long 1 tall 1 wide	The goal is located at the end of each level. Upon touching the goal the player is transported to the next level.	





4.2 Levels

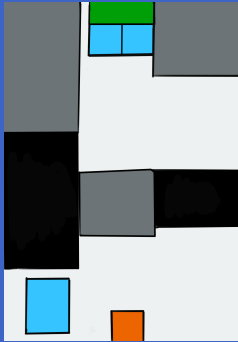
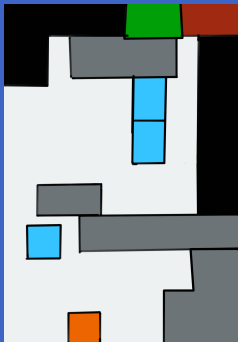
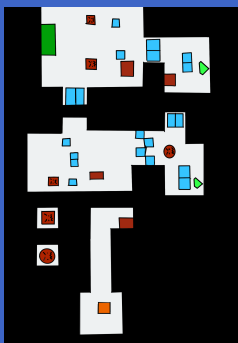
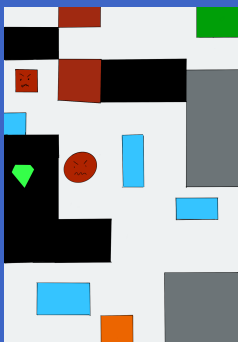
The prototype will include 15 levels following a teach, test, challenge level design strategy, where players will be introduced to mechanics/tools and be tested/challenged with said tool/mechanic to progress. The preliminary 5-6 levels are introducing the base mechanics/concepts; objects that players can move with the magnet gun, objects that move the player with the magnet gun, danger zones (aka lava and pitt falls) that will kill the player/restart the level, and our two main small enemies. In table 23 below, is a breakdown of each level, the preliminary design, whether it is a teach test or challenge level and the fastest/primary solution to that level's puzzle. *See fig. 11 for the legend.*

Table 23: LEVEL BREAKDOWN

Level no.	Level description	Level Sketch	Fastest Solution
1. Entrance to the Mines (Teach)	Magnus enters the mines and sees that previous miners have tried to make it difficult for new comers by blocking the elevator		Make an exit out of the cage of crates that surround you. Push crates out of way to get to elevator Get gems (optional) Push crates onto pressure plates
2. Let the Mine Move You (Teach)	After getting off of the elevator Magnus sees the complete disregard for OSHA regulations and sees the mine is littered with pitfalls. Luckily the magnet gun seems to be able to pull him if the magnetic object is big/heavy enough		Use the magnetic object on the left to pull you over the first pit and towards the next door Optional-challenge yourself to get the gem placed on the other side of a second hole
3. Pulled and Pushed (Test)	Someone really didn't want Magnus following them and it seems like this cave will be more dangerous than you originally thought. Time to push and pull yourself across		Use the magnetic object on the right to pull you over the first pit Optional-collect the gem Push the long object over the edge and use it to align yourself with the last big magnetic object Pull yourself over the second pit, move the rock out of the way of the exit.

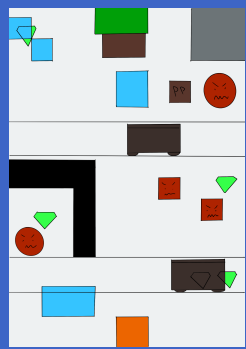
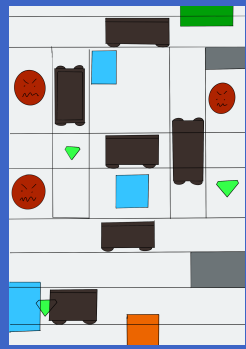
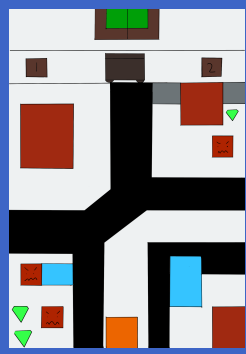
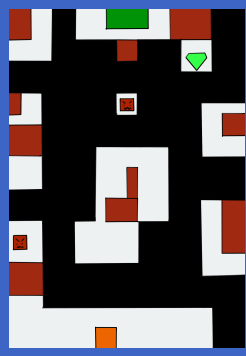




<p>4. Making your Own Paths (Test)</p>	<p>It looks like Magnus will have to continue to forge his own paths to make it over these pits of lava. Time to test what you've learned.</p>		<p>Pull the magnetic block over the danger pit on the right hand side. Then when you cross that area, move the rocks out of the way and move onto the next level.</p>
<p>5. An Attractive Goal (Challenge)</p>	<p>It looks like Magnus will have to find a way to pull himself over to the next door as it seems the only "path" is covered in lava.</p>		<p>Move the initial barrier out of the way. After that push the 2 moveable objects over the lava pitts to walk in line with the heavy magnetic object and pull yourself over to the goal.</p>
<p>6. Ghosts of Miners-Past (Teach)</p>	<p>The last door seemed to have dropped Magnus onto a series of islands floating in lava. Clearly Magnus is not the first to be here but he hopes he won't fall to the same fate as the previous miners who are now enchanted items and ghosts sprawled across the level.</p>		<p>Walk over to the edge of the first island, pull yourself over and then walk straight over to the edge and pull the two objects into the lava to make a bridge. Then you can pull the lamps over to the lava giving you clear access to the goal.</p>
<p>7. Ghosts, Gems, oh my! (Test)</p>	<p>Looks like the last level was just the start of running into these guys. Magnus will have to use his magnetism skills to make sure the ghosts and enchanted lamps don't hurt him and get to the next level.</p>		<p>Using the objects in the level push the ghost into the lava and pull the lamp into the pit as well. Using one of the left over blocks, make a bridge over the gap on the right and walk to the goal.</p>





<p>8. Minecart Traps (Teach MineCarts, Challenge otherwise)</p>	<p>Magnus has finally gotten deep enough that he is starting to see more and more treasure. And of course more tools to carry all that treasure. I wonder if this gun is powerful enough to move minecarts.</p>		<p>Push the first minecart over to trap the ghost on the left and then push the two lamps into the pit. Afterwards use the second mine cart and the moveable object to both trap the second ghost and activate the pressure plate revealing the goal.</p>
<p>9. Ghost's a la mine cart (Challenge)</p>	<p>An intimidating sprawl of ghosts and mine carts stare at Magnus as he enters this section of the mine. Looks like he will have to move these mine carts around <i>just</i> right to trap the ghosts and get to the doors.</p>		<p>Use the minecarts and moveable objects to trap the ghosts. Because there are no danger pits to lure them over, the player must think and act quickly to make sure they can safely make it to the other side.</p>
<p>10. Caught Between a Rock and a Falling Place (Challenge)</p>	<p>Magnus really has to step carefully here, seeing how most of this area is more pitted then firm ground. So he will have to navigate paths and avoid enemies skillfully or else he will lose more than just the treasure at the bottom of this mine.</p>		<p>Pull yourself over to the island on the right side and push the moveable object over to the middle. Pull the moveable object from the left island and drag that over to one of the pressure plates and pull/push the cart onto the other to fully reveal the door.</p>
<p>11. Polarized Paths (Challenge)</p>	<p>It seems the deeper Magnus gets the less ground there is to stand on. Either something has been tearing through this area of the cave or his predecessors really didn't like competition. Maybe both...</p>		<p>Pull yourself to the middle island and then go left. Once you access the top part of the middle island either pull or push the 2nd enemy off the platform so you can go there. Then you can get to the top of the left island where you can then access the top left island and use the final heavy object on the far right to pull you to the goal.</p>





<p>12. Pressure's On! And off, and On Again. (Challenge)</p>	<p>It looks like someone else is trying to use brains over brawn and set up a pressure plate based maze. This will take a lot of time to get you to the next door, at least they were nice enough to give you a metallic box to push onto the first plate.</p>		<p>Use the first object on the right of you to open the first wall. Then take it and go to the left to open the far left door. Once you do that, grab the 2nd moveable object on the right side of the maze and take both over to the middle section to hold down both pressure points and unlock the wall on the right. There you can use either of the blocks to unlock the final wall and access the goal.</p>
<p>13. Revenge of Miners-Past (Challenge)</p>	<p>For a moment you forgot about the ghosts of the miners before didn't you? Well looks like you won't forget again. Here lies all of the miners who seem to have gotten the furthest in the mine. And they are determined to make it very hard to let you go further than they did.</p>		<p>Use the minecart on the left to push the first ghost into the lava pit. Then use the magnetic object on the right to push the ghost over. Afterwards push that object over the edge and stand on it to get the ghost from the top to fall into the pit. Then utilize the block on the left to push the middle ghost into the right side pit and lure the top ghost into the top right pit. After all the ghosts are dealt with, walk over to the goal.</p>
<p>14. Diamond Encrusted Doom (Challenge)</p>	<p>Magnus can almost smell the treasure now, he's so close. There seems to be tons of jewels spilling out from the bottom of the mine, but be careful, it looks like they require finesse to reach them and others seem completely out of reach. Don't let greed kill you when you're so close Magnus! One more door and it's all yours!</p>		<p>Players can just walk to the goal if they are uninterested in getting the gems. This level is meant to be the calm before the adrenaline filled boss level.</p>





<p>15. A Spikey Surprise (Boss) (Challenge)</p>	<p>Magnus has accidentally entered the treasure hoard of a dragon. He must use all his knowledge and skills to escape in one piece.</p>		<p>Navigate around the lava pools. Push block 1 to make a bridge or go around. Push block 2 to make a bridge. Pull block 3 to make a bridge. Use the magnetic block to pull yourself across the gap. Pull the minecart out of the way to make a path. Press the pressure plate to win.</p>
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LEGEND

	Moveable magnetic objects		Icon indicating gem placement
	Magnetic objects that pull the player		Pressure Plate
	Magnetic based enemies		Walls/objects that do not be moved by player
	Non magnetic enemies		Player(starting point and scale ref)
	Left/right minecarts		Goal for the level
	Up/down minecarts		Danger zones aka Pitts or Lava floor

Fig.11 Legend key for Level Sketches

4.3 Missions

Other than completing the level, there are optional areas with hidden gems or loot that aren't mandatory to players in order to complete the level. The main mission for the player is to seek out the mine's hidden treasure.





4.4 Game Maps

Magnetism is a linear puzzle-based game. Where each level is generated off of sketch and built via a tile based system created by one of the team members.

Magnus or the player controlling him will spawn at the start of the game at the entrance of a mine, with their first task to gain access to the mine. Once Magnus has passed the first level, the player will typically start each level at the “bottom” of each level’s environment.

As players progress in the mines, and are introduced with new mechanics/aspects of the main game mechanics, the levels will grow in size and the puzzles will grow in complexity.

Refer to table 23 for more specific layouts of each level in the game.





4.5 Boss Fights

There are a total of 5 boss fights in Magnetism’s full release (Table 25). The prototype will only contain the first boss, the dragon, the details of which are found in table 24. The bosses focus on leveraging existing mechanics to test the player’s skills.

Table 24: FIRST BOSS DETAILS

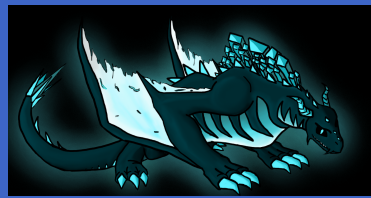
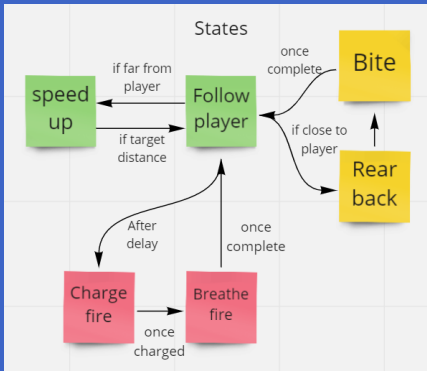
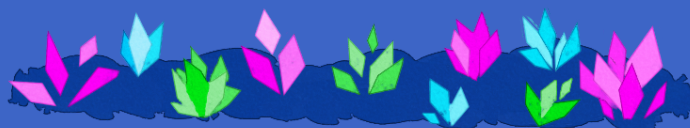
Properties	Details	
Scenario	The player enters the treasure horde of the boss. The boss chases the player from the left side of the screen. The player runs away and moves objects to create paths. The boss dynamically changes speed to pressure the player.	
Size	4 units tall, 4 units wide, 9 units long	
Win Conditions	The player can defeat the boss by stepping on a pressure plate at the end of the level. This plate will release a rockslide trap which 1-hit kills the boss.	
Damage	Fire Attack: 1 damage (3 hits to kill player) Stomp Attack: 3 damage (1 hit to kill player) Bite Attack: 1 damage (3 hits to kill player)	Boss Health: ∞ The boss cannot be damaged by regular attacks or objects
Movement Speed	The boss’s default movement speed is 1 unit per second (about 75% player speed). Its faster speed is 1.5 unit per second (about 125% player speed).	
Behaviour States and Transitions	<p>Follow: Default state. Boss follows player at 75% of their movement speed. Every 10 seconds the boss will chomp or breathe fire.</p> <p>Speed up: If the boss is off-screen, speed up. Once on screen again go back to normal speed.</p> <p>Stomp: If 1 unit from the player, stomp feet. Once more than 1 unit away, resume following.</p> <p>Fire: The boss charges its fire for 2 seconds then breathes fire for 3 across one side of the stage. This is foreshadowed by a smoke trail.</p> <p>Chomp: The boss rears back for 2 seconds then lunges forward 5 units with its jaws.</p>	 <pre> graph TD speed_up[speed up] -- "if far from player" --> follow_player[Follow player] follow_player -- "if target distance" --> speed_up follow_player -- "once complete" --> bite[Bite] follow_player -- "if close to player" --> rear_back[Rear back] rear_back -- "once complete" --> follow_player follow_player -- "once complete" --> charge_fire[Charge fire] charge_fire -- "once charged" --> breathe_fire[Breathe fire] breathe_fire -- "After delay" --> follow_player </pre> <p>State Diagram</p>





Table 25: BOSSES

Name	Scenario	Attacks	References
Boss 1: Dragon	The boss breaks through a wall at the left side of the screen and begins to chase the player. The player must run away to avoid being crushed by the boss. The player moves blocks to make paths while being chased. Upon reaching the end of the cave the player steps on a pressure plate to release a trap and defeat the boss.	<ul style="list-style-type: none"> -Bite: dragon rears back and then lunges forward to bite at the player -Stomp: dragon strikes forward with its claws -Fire breath: dragon shoots fire in a straight line along one side of the map. 	
Boss 2: Mega Drill	The player encounters another miner with a giant mining drill. The player must dodge attacks and pull the miner off the drill to win.	<ul style="list-style-type: none"> -Earthquake: slams the ground and stuns the player -Drill: swings drill in patterns to hit player 	
Boss 3: Meta Dragon	The meta dragon takes up the back of the screen and looms over the player. It attacks with its claws and tail, but can be repelled by the player magnet. The player must block the enemy attacks and use moveable objects to win.	<ul style="list-style-type: none"> -Grab: meta dragon reaches forward to grab the player -Sweep: boss sweeps its tail sideways across the stage 	
Boss 4: Lava Serpent	The lava serpent swims in and out of the lava pool. The player uses movable objects as a shield to block attacks and to fight the serpent.	<ul style="list-style-type: none"> -Splash: Splashes a wave of lava. -Strike: The serpent strikes forward and tries to bite the player 	
Boss 5: The Shadow	The shadowy manifestation of the combined greed of all the miners. It possesses and throws objects at the player. The player must move objects to light the room to expose it to harm by the magnet gun.	<ul style="list-style-type: none"> -Throw: throws magnetic and non-magnetic objects -Dark wave: sweeps a damaging wave of darkness at the player 	





4.6 Checkpoint/Save system

The levels we designed are relatively short and small, so it is not necessary to save every part of the game. Our decision is that when the player dies, the player will return to the starting point of the current level and reset level.

4.7 Achievements

There is no achievement system we have in place yet, however we might consider that once we move past the prototype stage (for publishing on Steam). For now our achievements are measured by progression, time spent and gem collection and the main achievement for the game beating the game/boss.

Level Achievements:

At the end of each level we will award players with a one to three star rating based on the following criteria:

- Time Spent in level (less time spent=higher rating)
- Are all gems collected?

Gem Achievements:

Players are also encouraged to collect as many gems as possible to unlock the following two achievements built into the game:

1. Unlocking the Gym

When players collect 30 gems over their time spent in the game (approximately 60-70% of all gems), they will unlock the Gym to be accessed in the main menu. Here players can test their skills and interact with any and all of the objects found throughout the game in a safe area. Until the point that players unlock this achievement, the menu will show that option as locked and show players that they need 30 gems to access it.

2. Unlocking the Art

When players collect 50 gems in the game (100% of the gems) they will have beaten the game and unlocked the Art in the main menu. Players can look through models and small concept environments/sketches at their leisure. Until that point, the menu will show that option as locked and show players that they need 50 gems to access it.

*Determined number to be placed at later time when game is closer to completion





4.8 Beat Map

Beat maps, help to gauge the ratio of excitement/frustration the player might or *should* experience in the game. Below we have a beat map link for the overall game, breaking down details from colour schemes, to NPC's to time spent to mechanics used in each level.

<https://docs.google.com/spreadsheets/d/1k0P345Uvk4alxwDIC7f7FsJROP6rBQnZLHv0dWOIGuk/edit?usp=sharing>

Overall the game aims to grow steadily in difficulty, as you can see after level 7 when all mechanics and grunt enemies have been introduced the levels get slightly longer and more complicated until they reach the final level where they have mastered the controls and their ability to manipulate their surroundings with confidence. The pinnacle will be the boss “fight” where players are challenged to put their skills to the test and run through obstacles to avoid the dragon and make it out of the mine with their life.

5.0 Game Interface System

5.1 Collectibles HUD

When collectibles are collected in any given level, the player's total gem count is shown in the top left corner of the screen via the UI element (fig. 12) which appears for a moment before leaving the screen. This total gem count is a notifier of the player's progress as this count is the player's total gem count over the entire game and not the current level. This will help inform players on how close they are to unlocking the bonus levels.



Fig.12 The total gems collected UI element (Collectible HUD)





5.2 Health Bar HUD

Displayed in the top right corner of the player's HUD is Magnus' health bar. Displayed are three hearts. When the hearts are depleted, Magnus will die and the level will reset. The player will start each level with a full three hearts and, when hit, will lose one heart at a time. The player will lose hearts via coming into contact with an enemy or environmental hazard (pit, lava). The health bar will update with every hit he takes and will always be on the screen for the duration of gameplay.



Fig.13 Magnus' health bar UI

6.0 Menu Guide

Below is a short overview of all the menus/menu screens found in the build.

6.1 Start Menu

The first thing the player sees when they boot up the game. Players will start out with having the option to start the game, or access the credits screen. When players collect enough gems all 4 tabs will be accessible. See fig. 14 for what the fully unlocked main menu will look like, figs 15 and 16 show UI text displayed on hover.



Fig. 14 Main/Start Menu when players have collected all gems



Fig. 15 Main/Start Menu hovering over blocked out Gym tab



Fig. 16 Main/Start Menu hovering over blocked out Art Sample tab





6.2 Pause/Level Select Menu

Accessible when the player clicks on the “Menu” icon in game, players will see a Level Select Menu (Fig. 17). Here the player can choose between changing the scene/level they are playing, resuming play (by pressing the Close button) or retreating to the title screen/main menu by selecting that icon.



Fig. 17 Screenshot of Level Select Menu

6.3 Credits Screen

Displayed via the main menu under the “Credits” tab, here players can look at the credits outlining the team and their roles on the project. See fig. 18 for our alpha build version of this screen.



Fig. 18 Credits Screen, grabbed from alpha build





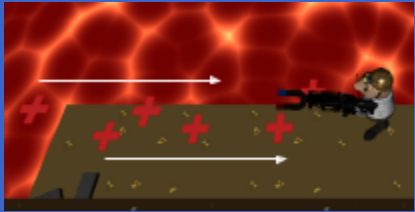
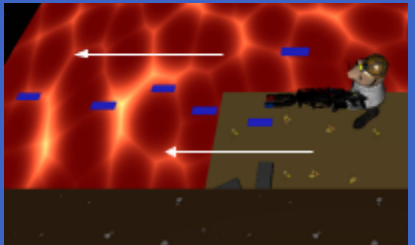

7.0 Special Effects

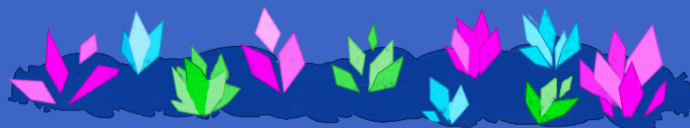
The special effects in Magnetism are broken into three key categories, character effects, item effects, and environment effects. Character effects are all effects which relate directly to the player character, item effects are related to interactable items and objects, and environment effects are passive effects in the game environment.

7.1 Character Effects

The following table (table 26) contains the full list of all character related special effects in the game.

Table 26: CHARACTER EFFECTS

Name	Description	Use	Appearance Condition	Visuals
Positive Magnetic Particles	Red plus sign particles scroll continuously towards the player from the end of the magnet range to the tip of the magnet gun.	These particles give the player a visual indication that the magnet gun is being used in addition to the direction and polarity of the magnetic force.	When the player presses left click to attract a magnetic object. The particles will remain visible as long as the button is held down. Appears in all levels.	
Negative Magnetic Particles	Blue minus sign particles scroll continuously away from the player from the tip of the magnet gun to the end of the magnet range.	These particles give the player a visual indication that the magnet gun is being used in addition to the direction and polarity of the magnetic force.	When the player presses right click to repel a magnetic object. The particles will remain visible as long as the button is held down. Appears in all levels.	
Damage flash	The player flashes red then transitions back to their regular colour over the course of 1 second.	This combines with the damage animation to indicate the player has taken damage.	This will play any time the player's health decreases. Appears in all levels.	


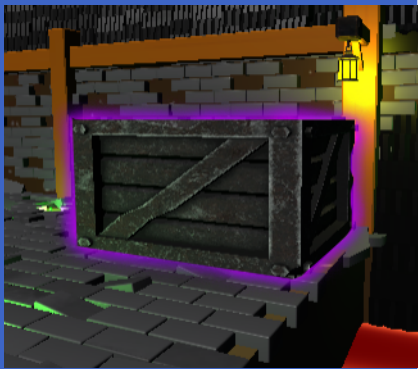




7.2 Item Effects

The following table (table 27) includes all item effects found in the game. Item effects are effects tied to any interactable items and objects in the game.

Table 27: ITEM EFFECTS

Name	Description	Use	Appearance Condition	Visuals
Collectible Particle	White sparkles radiate outwards from the collectible's position over the course of 2 seconds.	These particles indicate to the player that a collectible was successfully collected.	When the player touches a collectible it will disappear and this effect will play.	
Moveable Object Glow	A faint purple outline glow effect around all moveable objects found in the scene. This effect is continuous and will persist as long as the object remains in scene.	This effect indicates to the player that an object can be moved rather than remaining stationary and that it is interactable.	Appears on all moveable objects in the game. Moveable objects are found in levels 1, 3-10, and 12-15.	

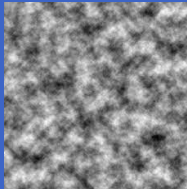
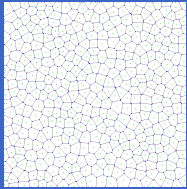
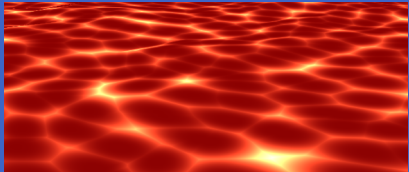
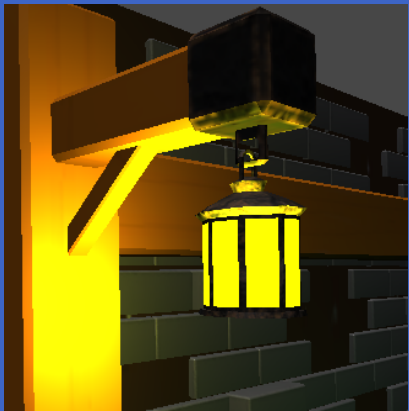




7.3 Environment Effects

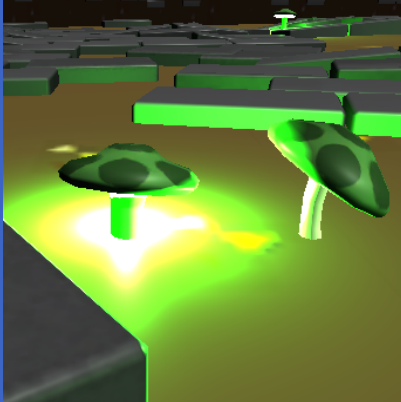
The Following table (table 28) contains all the environmental effects found in the game. These are effects tied to all static and non-interactable objects which make up the game's environment.

Table 28: ENVIRONMENTAL EFFECTS

Name	Description	Use	Appearance Condition	Visuals
Lava	Hot glowing Lava is found between the level platforms in the game's levels. The lava will change and roll to give off a moving effect. Gradient noise and voroni effects will be combined to create a more dynamic look. This effect will loop infinitely.	The rolling lava will just indicate to the player that this is a Hazard area and players should not walk there.	This effect will appear in all levels which contain lava. (Levels 2-8, 10, 13-15).	 <p>Gradient noise will be scrolled for the texture.</p>  <p>Voronoi will set the lava shape</p>  <p>Desired end result</p>
Lamp	Lamp that will provide environmental lighting in the levels. The Lamp will be static to continuously light the nearby area.	Environmental decoration that shows the complexity of the surrounding environment and emphasizes the visual storytelling of the environment and background.	Lamps will be found attached to walls in the game environment. Lamps will appear in all levels.	





Mushroom	Mushrooms that provide environment lighting in the level. The mushrooms will be static and continuously light the nearby area.	Environmental decoration that shows the complexity of the surrounding environment and emphasizes the visual storytelling of the environment and background.	Mushrooms will appear scattered in the environment. They will appear in all levels.	
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8.0 Use of Audio

8.1 Audio Overview

Audio is an important aspect in Magnetism. It is used to immerse the player in the game’s setting, provide feedback, and make actions feel satisfying. The audio in Magnetism is broken up into three categories: Background Music (BGM), Sound Effects (SFX), Ambience. All audio files are .wav files to make looping feel seamless (important for immersion).

Background Music (BGM)

Sound files that loop in puzzle levels where players will spend a majority of their time. The BGM in Magnetism are relaxing and non-intrusive to promote players to focus on the puzzles, but need to be a faster tempo in boss sequences to induce anxiety and urgency.

Sound Effects (SFX)

Short sound bytes (often noise or UI sounds) that are often activated by in-game events (clicking on menu buttons, pressing on a pressure plate, or switching between magnet modes).

Ambience

Environmental sound or noise files often used to immerse the players into the game’s setting. Sound files that emulate “lava bubbling” help bring a level to life and make it feel more real.





8.2 Music Asset List

The Music Asset list can be found as a spreadsheet in the link below.

The spreadsheet shows the name of the sound file, type of sound life, sound genre, source, description, if the sound is done, and if the sound is implemented or ready to be implemented.

<https://docs.google.com/spreadsheets/d/1zeMrqwVZhK9kJeNwV7I2LL5EXuB2y7SpEN7wRikBEWg/edit?usp=sharing>

8.3 Custom Sound Effect Asset List

Custom Sound effects that need to be composed are part of the Music Asset list spreadsheet

<https://docs.google.com/spreadsheets/d/1zeMrqwVZhK9kJeNwV7I2LL5EXuB2y7SpEN7wRikBEWg/edit?usp=sharing>

