



# 23CSIS01I

# System Analysis and Design

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# **Game Design Document Outline**

#### 2. Game Overview

#### 2.1. Genre

Action, Adventure, Platformer

#### 2.2. Target Audience

Children above 12 years old

#### 3. Dramatic elements of the game

#### 3.1 Characters:

Boo (Main Character player)

Boo is a disciplined, lonely, quirky, and easily alarmed young white ghost who navigates "Host Town" searching for humans to turn into ghosts to keep him company. During his journey, Boo must find a way to overcome the obstacles separating him from the humans he is trying to turn into ghosts. He is also fighting and hiding from the BooBusters trying to catch him, which made him become a fast learner. Boo sets off on his journey only being able to punch enemies, however, as he progresses through the town, Boo acquires special abilities of the humans he turns into ghosts, including the ability to go through walls from construction workers, shoot guns from policemen, swim from penguins, and release a chemical that can go through the BooBusters' armours.

#### BooChifu (Non-Playing Character)

BooChifu is an old white ghost that is a product of Boo's imagination. He is the abstraction of Boo's spiritual subconscious. BooChifu is wise, calm, and clever. He has small, closed eyes, wrinkles around his eyes, a big thin moustache and beard, and he wears a big yellow Asian conical hat. BooChifu mentors Boo during his journey by giving him hints throughout the game and occasionally giving him the needed riddles to go through the levels.



Construction workers are strong, traditional, and hard-working humans. They condemn ghosts and think they are the devil's work. They have big round faces and eyes. They wear red shirts and denim overalls along with a pair of brown worker boots, gloves, and safety hats. They are categorised into 2 types: walking and non-walking. Both types of Construction workers fight Boo by throwing red bricks at him and when killed, they give Boo the special ability to go through walls.

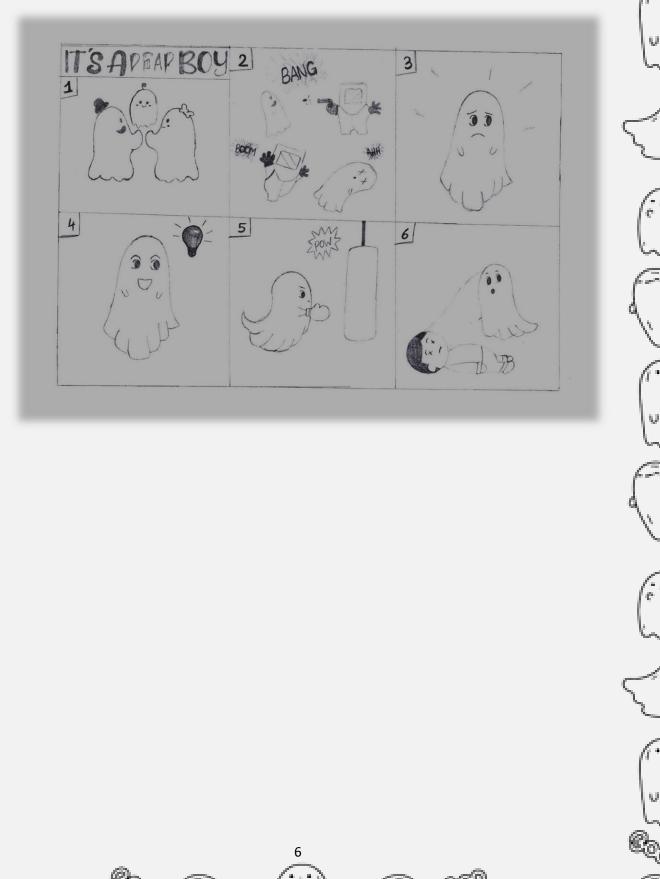




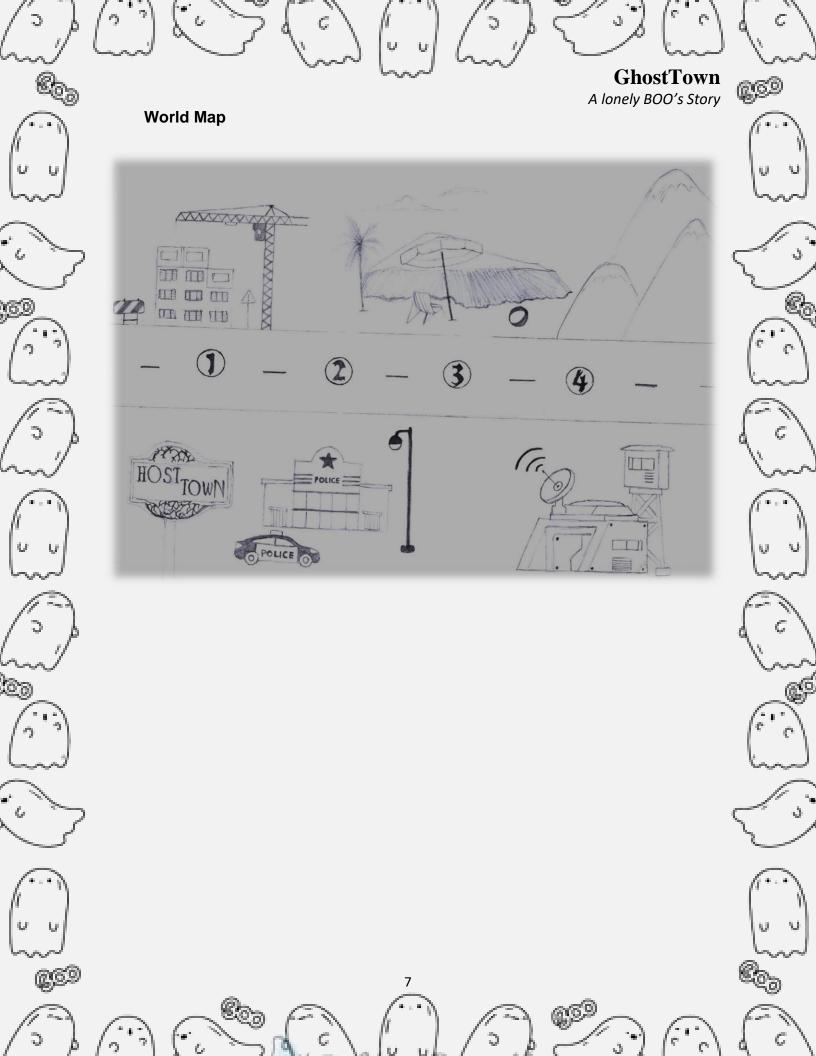


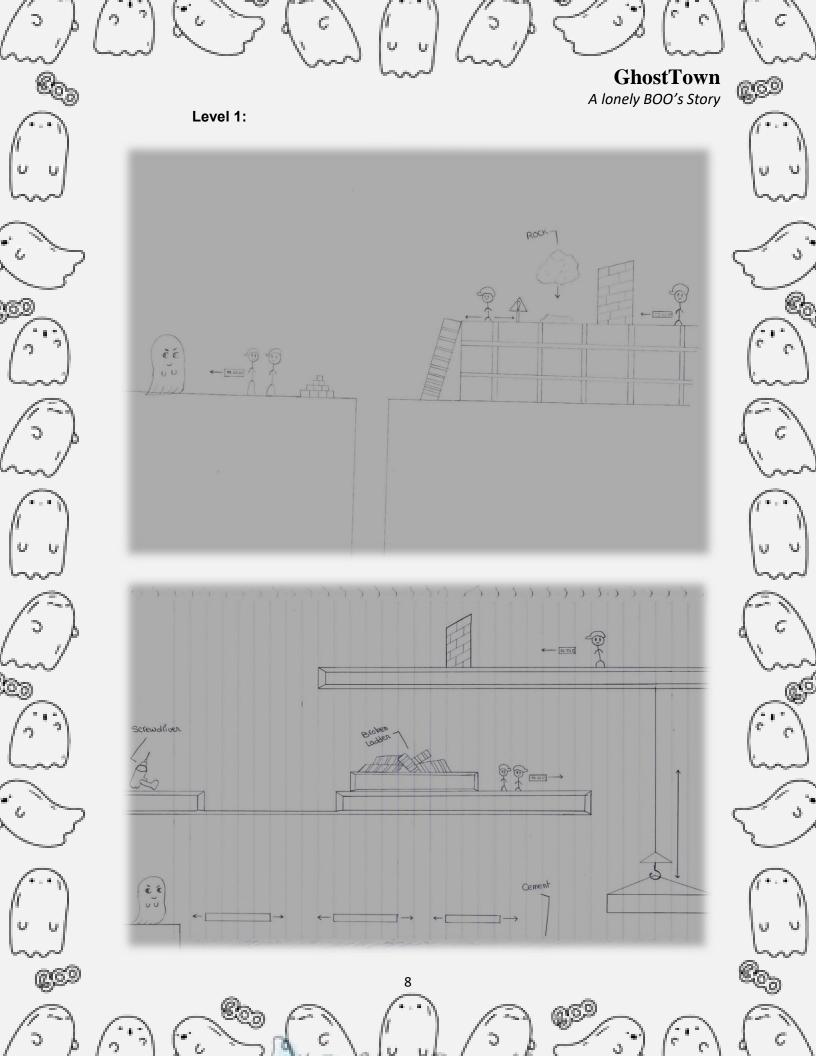
GhostTown A lonely BOO's Story The World Map will have a few levels that the player can choose between which will be bounded by the screen/camera. They cannot leave the bounds of the screen in this section. The boundaries of the Construction Site will start off scene 1 with an active construction site which the player can only get out of through a brick wall and scene 2 is a mini obstacle course. The level will end at the top of that obstacle course. The boundaries of the Police Station will start at the entrance where a few security guards will be standing watch. Boo can go through 2 doors here but only 1 is unlocked at that time. That door will lead to another room with a few other policemen and a few platforms. In that room, Boo can enter the vent to lead back to the first room which will allow him to access the locked door with the key he found. That door will lead to a small room with a cell which is where the level will end. The boundaries of the beach start at the sand obstacle course until he reaches the water body at the end of the first scene. Scene 2 is in the water; however, the boundary is everything contained within the coral reefs up to the entrance of the BooBusters Headquarters. The last level is the BooBusters HQ which starts off scene 1 in a room with a few people standing guard with multiple platforms and ends at an air vent and scene 2 is in a different room with an obstacle course which ends at the final door. **Detailed Story**: **Storyboards/ Game Sketches:** 

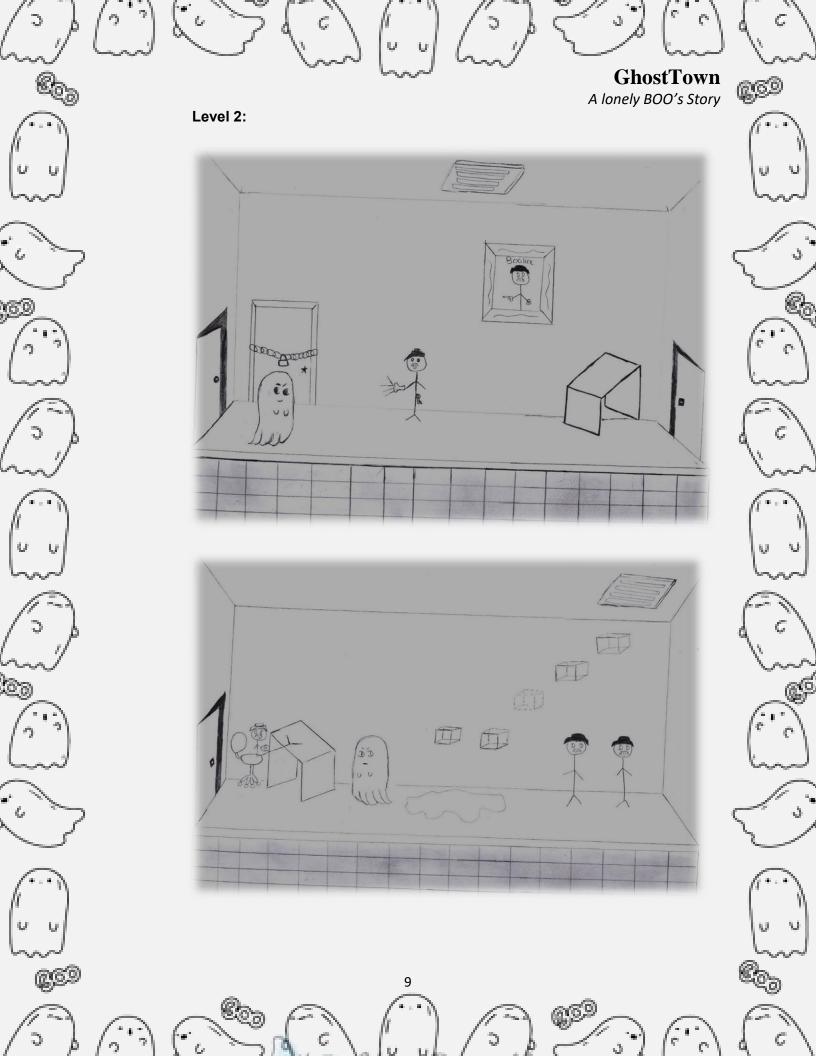


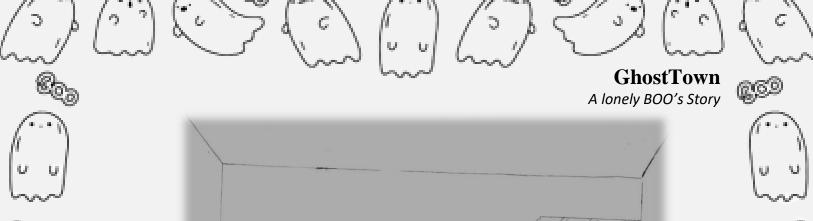


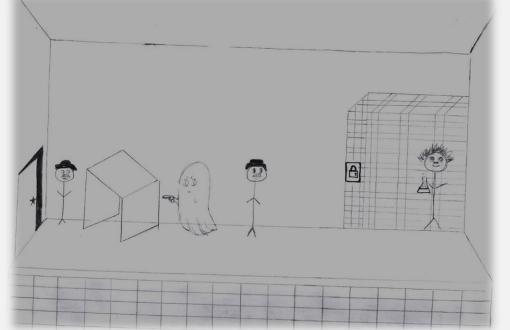
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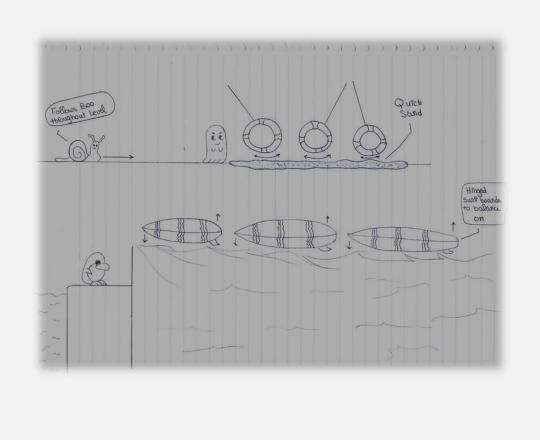








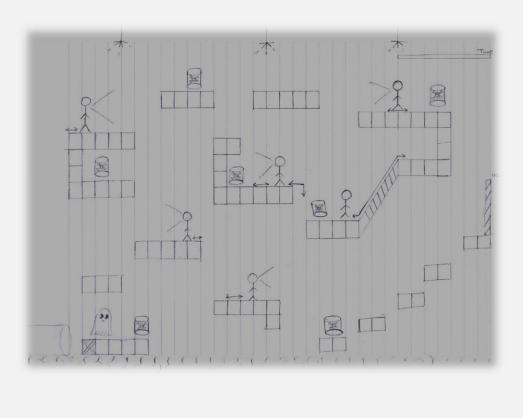
Level 3:

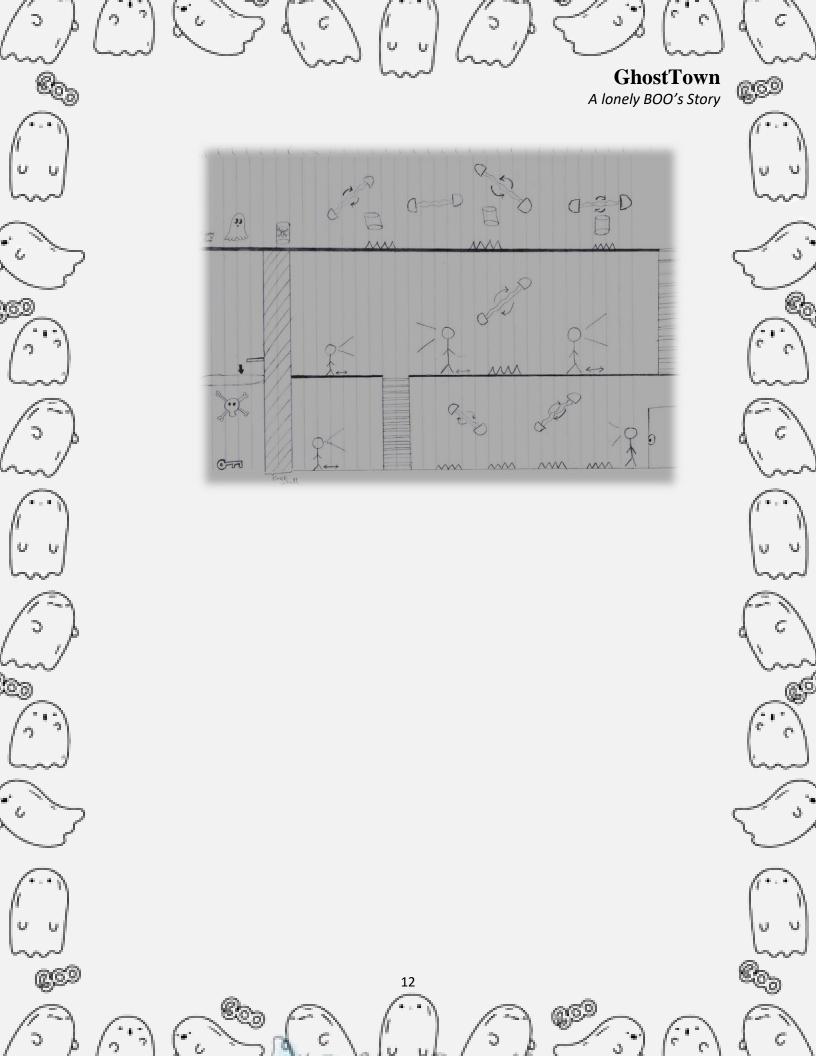




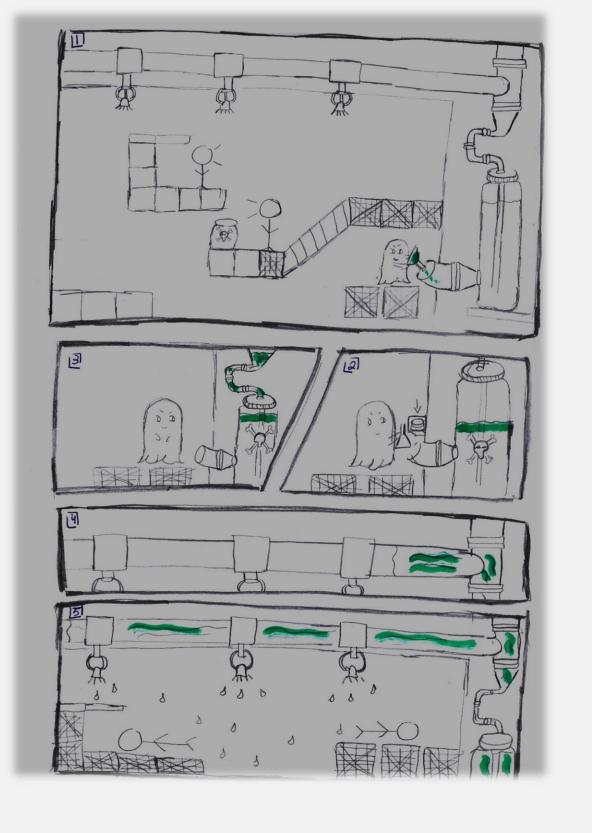


Level 4 (final):















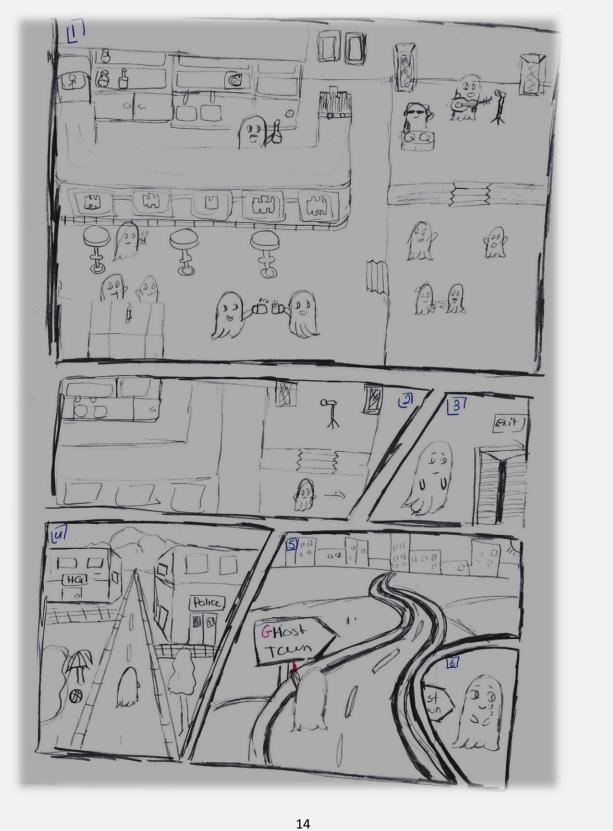






## Final Cut Scene:

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#### **Back Story:**

Once upon a time, there lived a small but happy ghost family in Host Town called the BooBanks. The father, BooMark, and mother, BooLisa, welcomed their newborn and were fondling all the possible names to give their dear child. One day, the BooBusters, a vicious ghost-killing crew, raided the BooBanks' home and killed BooMark and BooLisa. Because the baby ghost was too little to be identified by the BooBusters' ghost detectors, he was the only survivor. A baby in a big world, with no family, no friends, and no name, just Boo. As years passed, Boo had to teach himself everything to survive in a world full of humans, only humans. He was incredibly angry with the BooBusters for killing his family, tired from having to hide in the shadows, and above all, extremely lonely.

#### **Game Story:**

Boo set out on a quest to kill all humans in Host Town, including BooBusters, to solve all his problems once and for all. Boo practiced a lot of punching, and, like all ghosts, could suck dead people's spirits and gain their greatest abilities. Also, Boo's imaginary spiritual mentor, BooChifu, will help give him courage and support throughout his journey. The 4 main densely populated places in Host Town that Boo is targeting are the construction site, police station, local beach, and the BooBusters' Headquarters. According to his calculations, attacking these four places would guarantee the killing of all humans in Host Town. During his mission, Boo must enter each building and turn all the humans inside into ghosts while overcoming obstacles and hiding from the BooBusters. Boo fights the construction workers throwing red bricks at him by punching them and gaining the ability to go through walls. Then, Boo gains the ability to shoot guns by defeating the policemen firing their pistols at him and solving a puzzle to free the scientist, who then reveals to him the chemical formula needed to penetrate the BooBusters' armors and a secret entrance to the BooBusters' Headquarters through an underwater tunnel. Consequently, Boo goes to the beach and has to run away from snails and fight penguins to get the ability to swim and go through the underwater tunnel to the BooBusters' Headquarters. Finally, Boo goes through the BooBusters Headquarters defeating his last standing enemies and the only remaining humans in Host Town.

When Boo defeats the BooBusters, his mission is finally complete, and he feels like he finally belongs in a town where he is surrounded by fellow ghosts who fill the void of his lost family and changes the town to a Ghost Town where ghosts live happily together.

#### **Character Roles:**

#### **Boo (Main Character player)**

Boo navigates "Host Town" searching for humans to turn into ghosts to keep him company. During his journey, Boo must find a way to overcome the obstacles separating him from the humans to turn them into ghosts while fighting and hiding from the BooBusters. Boo sets off on his journey only being able to punch enemies, however,



as he progresses with his journey, Boo acquires special abilities of the humans he turns into ghosts to earn more abilities. For instance, he gets the ability to go through walls, shoot using guns, and swim, from construction workers, policemen, and lifeguards on the beach, respectively. He also gets the chemical formula of a radioactive substance that can penetrate the BooBusters' armors and will eventually be able to absorb it and shoot radioactive chemicals to kill BooBusters.

## **BooChifu (Non-Playing Character)**

BooChifu mentors Boo during his journey by giving him hints throughout the game and occasionally gives him the needed riddles and support to go through the levels. Even though he is not real and lives in Boo's mind only, BooChifu is greatly helpful and will offer valuable aid to Boo.

#### **Scientist (Non-Playing Character)**

The scientist is a non-playing character that only appears once, imprisoned in the police station. Although he once worked with the BooBusters and invented their invincible armour, the scientist has turned against them and created a special radioactive chemical that would penetrate the BooBusters' armors and kill them. The scientist reveals to Boo the formula of said chemical along with a secret underwater entrance to the BooBusters' headquarters so that Boo can sneak in and defeat them.

#### **BooBusters (Enemy)**

BooBusters are fearless, angry warriors who appear in the final level of the game. They are determined to rid Host Town of ghosts, so they carry detection tools everywhere they go that enable them to catch and kill ghosts. BooBusters' armours are bulletproof and are unaffected by punching or any weapon initially known to Boo. BooBusters have red detection cones that represent danger zones. If Boo gets detected, he will be instantly killed.

# **Construction workers (Enemy)**

Construction workers appear in the first level of the game, and they fight Boo by throwing red bricks at him. There are 2 types of construction workers walking and non-walking. When Boo manages to kill them, they give him the special ability to go through walls.

# Fighter Policemen (Enemy)

Policemen appear in the second level of the game. They fight Boo by shooting their firearms at him which causes more damage to his health than punching or brick throwing.



# Lazy policemen (Enemy)

Policemen appear in the second level of the game. They are lazy and eat donuts, and when killed they give Boo the ability to shoot guns.

#### **Guard policemen (Enemy)**

The police security guard appears in the second level of the game. He has a flashlight that acts like a detection zone. If Boo gets caught in the zone, he will be killed. The police security guard can only be killed by a gunshot.

#### **Snail (Enemy)**

Snails appear in the third level and chase boo until he gets to the water. They are protectors of the local beach and find joy in chasing ghosts out. If they catch up, they will be able to kill him. Boo, on the other hand, cannot kill the snails. Therefore, Boo has no other option but to run away.

#### Penguin (Enemy)

Penguins appear in the third level of the game. They are the best swimmers on the beach, hence when Boo kills them, he will be able to swim as well as they do.

#### **Challenges:**

Every enemy challenges Boo in a different way. Construction workers throw bricks at him, policemen shoot him, the snails chase him, and BooBusters kill him when detected. Boo must dodge all objects thrown/shot at him. He also must hide from BooBusters' detection space and policemen's flashlights and run away from the snails. In addition, he must figure out how to jump on moving objects, evade interpolating and falling obstacles, and deal with sabotaged surfaces (hot coffee, slippery ground, quicksand, unsupported boxes).

#### 4. Formal elements

#### 4.1. Mechanics

#### 4.1.1. Player interaction pattern:

Single player.

#### 4.1.2. Goals:

- The main goal of all levels is to turn all humans in that level into ghosts and gain their abilities.
- The goal of level 1 is to gain the ability to go through brick walls and turn all construction works into ghosts by punching them.



- The goal of level 2 is to be able to shoot using guns, turn all policemen into ghosts by shooting them, get the key to open the locked door and free the scientist from the cell.
- The goal of level 3 is to be able to swim, turn penguins into ghosts by punching them, get the crab to cut the net, get a lid to cover the water pump and, get to the BooBuster Headquarters' entrance underwater.
- The goal of level 4 is to collect enough chemicals to spray the BooBusters and kill them, get the ability to absorb the chemical and spray it to kill off the BooBusters turning them into ghosts, and get the key to open the final door.

#### 4.1.3. Rules

#### The player can:

- Jump and move (left and right)
- Punch
- Absorb abilities from enemies
- Push boxes to fill gaps
- Get damage from bricks thrown at him from construction workers
- Go through brick walls using their ability
- Get killed if detected by policemen's flashlight and BooBusters detection zone
- Kill policemen by shooting them
- Get damage from policemen if shot at, and if shot at 3 times is killed
- Get killed if caught by snail during chase
- Balance on rotating platforms to not fall off
- Collect/pick up barrels to put them in vent
- Absorb chemical barrels to be able to spray chemicals at the BooBusters and swim in chemical waste

#### The player can't:

- Fight the police guard without the ability to shoot
- Jump while standing on sand in level 3
- Swim (without the penguin's ability)
- Chase snail on the beach in level 3
- Punch or shoot BooBusters using guns
- Survive BooBuster's weapons without first absorbing the chemical barrels.



# 4.1.4. Actions and interactions:

**Actions and interactions:** 

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//-----Construction Level 1-----//

Brick Actions	Non-Walking Construction Worker Actions	Non-Walking Construction Worker – Player Interaction
Thrown horizontally.  If it collides with the player, it decreases their health.	Throws bricks every 2 seconds.	The player punches the Construction Worker.  The construction worker takes damage and dies after 3 punches.

Crane Action	Platforms Action	Rock Action
Moves Vertically at low speed.	Moves left and right.	Falls every 1 second.
	3	If collides with the player, he dies and is moved to the last checkpoint.

Screwdriver Action	Player - Brick Wall Interaction	Walking Construction Worker Actions
Fixes the broken ladder on collision with the ladder's broken pieces.	Prevents Boo from passing through.  Allows moving through if the ability is active.	Moves left and right.  Throws bricks every 2 seconds.  If the player touches a construction worker or gets hit by the bricks, his health will decrease.





Guard Policeman Action	Lazy Policeman Action
Moves left and right with a flashlight.	When defeated, he gives the player the ability to shoot guns.
If the player is detected by the flashlight, he must restart the level.	
Spawns a key for the player to unlock the door when defeated through shooting.	

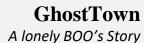
Fighter Policeman Action	Player – Hot Coffee Interaction
Shoot bullets at the player.	The health of the player decreases when he steps on the hot coffee spills on the floor.

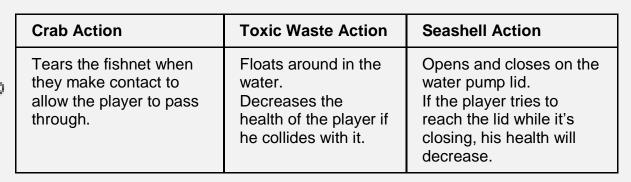
# //-----Beach (Water Level) 3 -----/

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Snail Action	Floating rings Actions	Surf Boards Action
Chases the Player.  If collides (catches)	Swings left and right at moderate speed.	Pivots around its midpoint when the player collides with them.
the player, the player dies.	If it collides with the player, health is decreased.	

Penguin-Player Interaction	Jellyfish Action	Fishnet Action
Player Fights the penguin by punching.  When defeated, it gives the player the ability to swim.	Moves up and down.  If the Jellyfish collides with the player, the health of the player decreases.	Spawns a crab elsewhere when the player collides with it.





Water Pump Action	Water Pump Lid Action
Pumps water at a high pressure preventing the player from passing through.	When it collides with the water pump, it closes the pump allowing the player to pass through.

# //-----Boo Busters Headquarters Level 4-----//

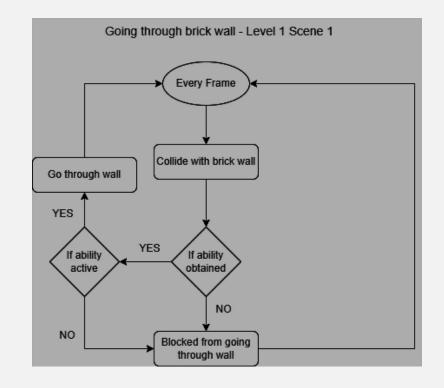
Boo Buster Action	Player – Falling Block Interaction	Electric Rod Action
Moves left and right with a red detection zone.	Block Falls and disappears 1 second after the player lands on it from	Rotates at 360 degrees.
If the player is detected by the detection zone, he must restart the level.	the top.	Decreases the health of the player if he touches them.

Player-Spikes Interaction	BooBuster – Player Interaction
Spikes decrease the health of the player on collision.	The player fights the Boo Busters by releasing chemicals from his body without getting detected by them.

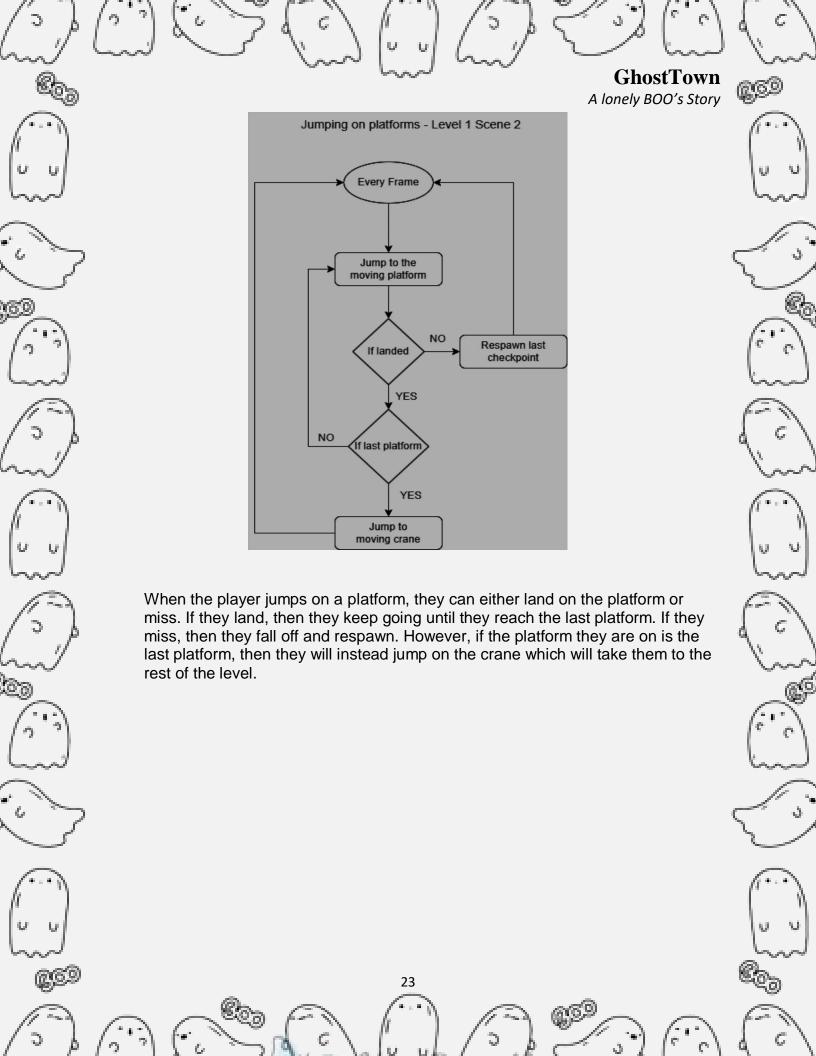


### Flow Charts:

### Level 1:

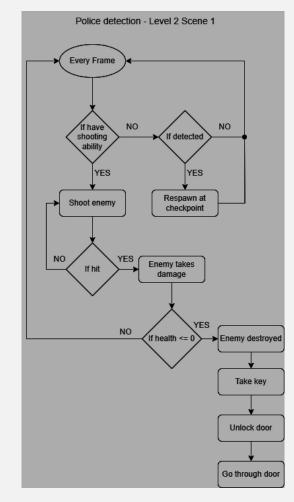


When the player collides with the wall, if the player has the ability to go through the wall and the ability is activated, they can go through the wall. If not, the player is blocked by the wall.



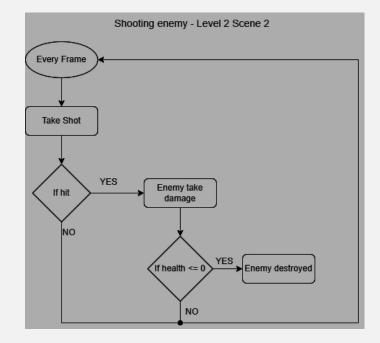


#### Level 2:



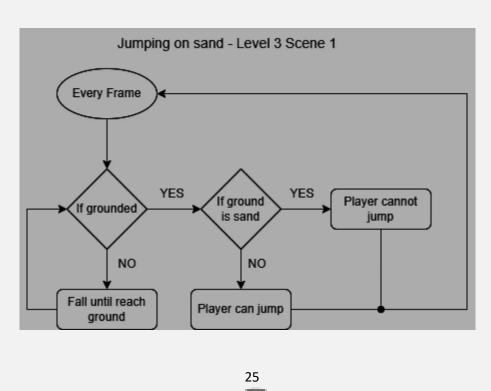
This scene has 2 modes. The first one is when they first enter the level. As they don't yet have the ability to shoot then that is the check we made. If that's the case then if the security guards detect the player then he will die instantly. However, if they did acquire the ability and then entered that scene from the vent entrance, then they could fight the policemen and would not die instantly if they got shot.

# GhostTown A lonely BOO's Story



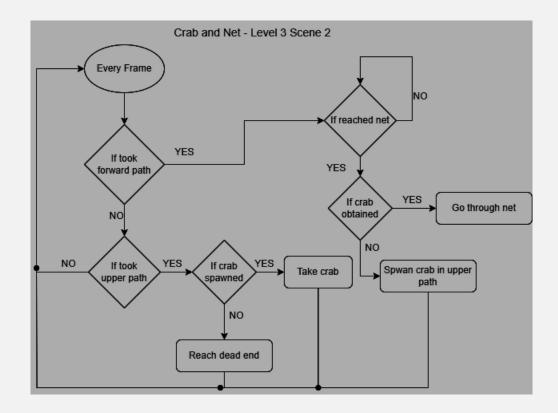
When the character takes shots, if the enemy was hit by the shot, the enemy takes damage, if not then nothing happens and the game continues normally.. However, if the enemy takes damage and his health is less than or equal to 0 then the enemy is destroyed, otherwise nothing happens.

#### Level 3:





When the character reaches sand on the beach, if the player is on the ground and the ground is sand, then the player won't be able to jump. However, if the ground is not sand then the player can jump normally. If the player is in the air they will fall until they reach the ground.

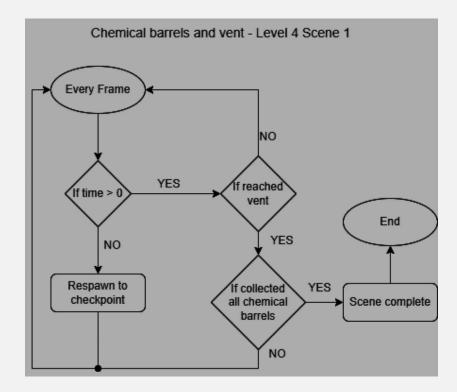


If the player takes the forward path and reaches the net after obtaining the crab, the player will be allowed to go through the net. However, if the player reaches the net without the crab, the crab will be spawned in the upper path. If the player does not reach the net, nothing will happen.

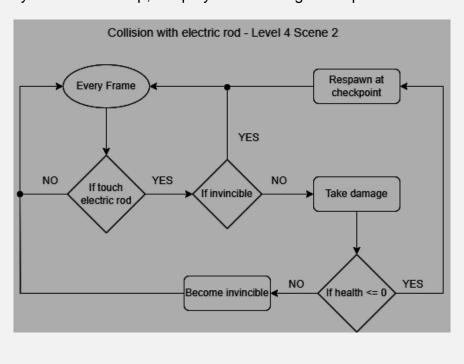
If the player takes the upper path and the crab has been spawned, the player will be able to pick it up, otherwise, they will have to take the other path.

# GhostTown A lonely BOO's Story

#### Level 4:



As there is a timer in this level, the time is checked in every frame and is compared to the time limit. If they still have time left and reached the vent with all the chemical barrels, they move on to the next scene. However, if the vent was not reached or all the barrels were not collected then the game moves on normally. If the time is up, the player dies and gets respawned.





If the player touches the electric rod and is invincible, nothing happens, but, if they aren't invincible then the player will take damage and their health will be reduced. If the player's health is less than or equal to 0, then they will respawn at the checkpoint, otherwise, they will become invincible for a few seconds.

# 4.1.5. Challenges:

#### Obstacles include:

- Avoiding bricks thrown by construction workers and falling rocks
- Going through walls, moving boxes to fill gaps in the ground.
- Jumping on moving platforms without falling off
- Avoiding being detected by policemen flashlights and BooBusters radars
- Avoid getting shot by policemen.
- Avoid hot coffee spilled on the ground.
- Solving puzzle to free scientist
- Avoid getting caught by snails running after player.
- Avoid swinging floating rings while on sand which slows player down.
- Balance on surfboards to get to beach.
- Avoid getting stung by jellyfish.
- Finding a way to cut net using crab.
- Finding a way through water pump current
- Avoid sharp spikes.
- Avoid electrical rods.

# Opponent/enemies include:

- Construction workers
- Guard Policemen
- Lazy Policemen
- Fighter Policemen
- Snails
- **BooBusters**
- Jellyfish
- Clam

#### 4.1.6. Resources

- Health, when reduced to 0 the player dies and respawns at the last checkpoint.
- Collected abilities like going through walls, shooting guns, swimming, and spraying chemicals to kill BooBusters, can be cycled through and activated, used to pass levels.





















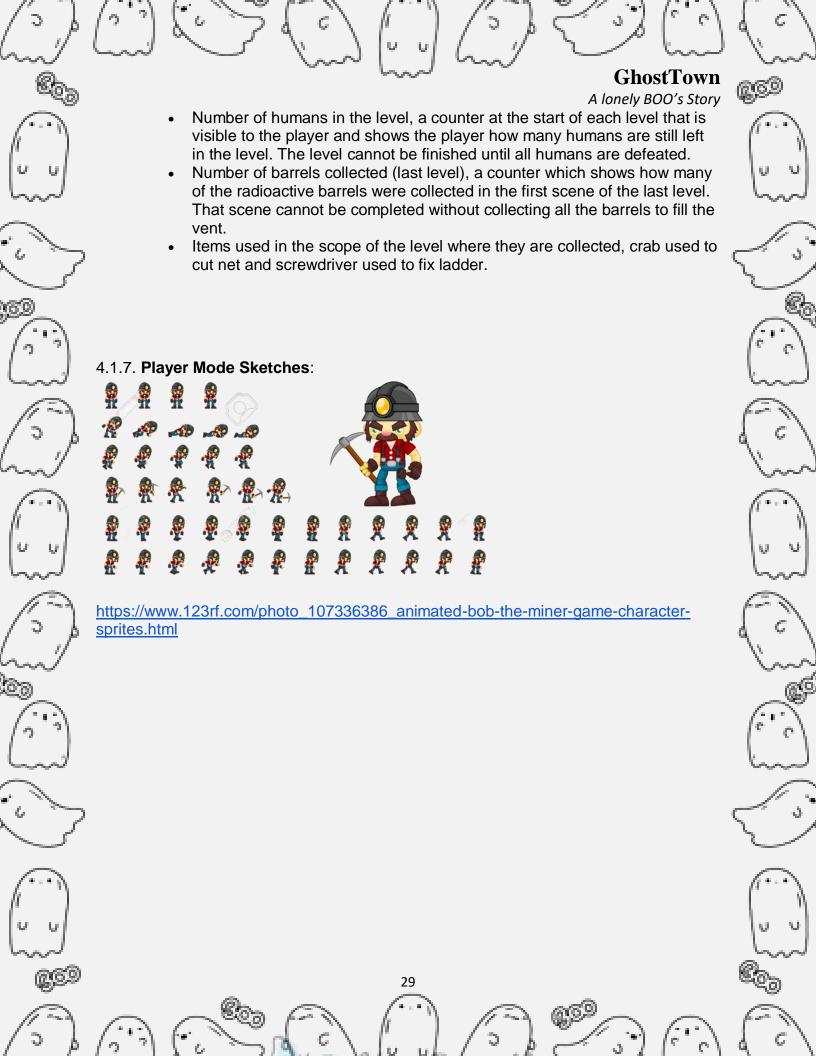


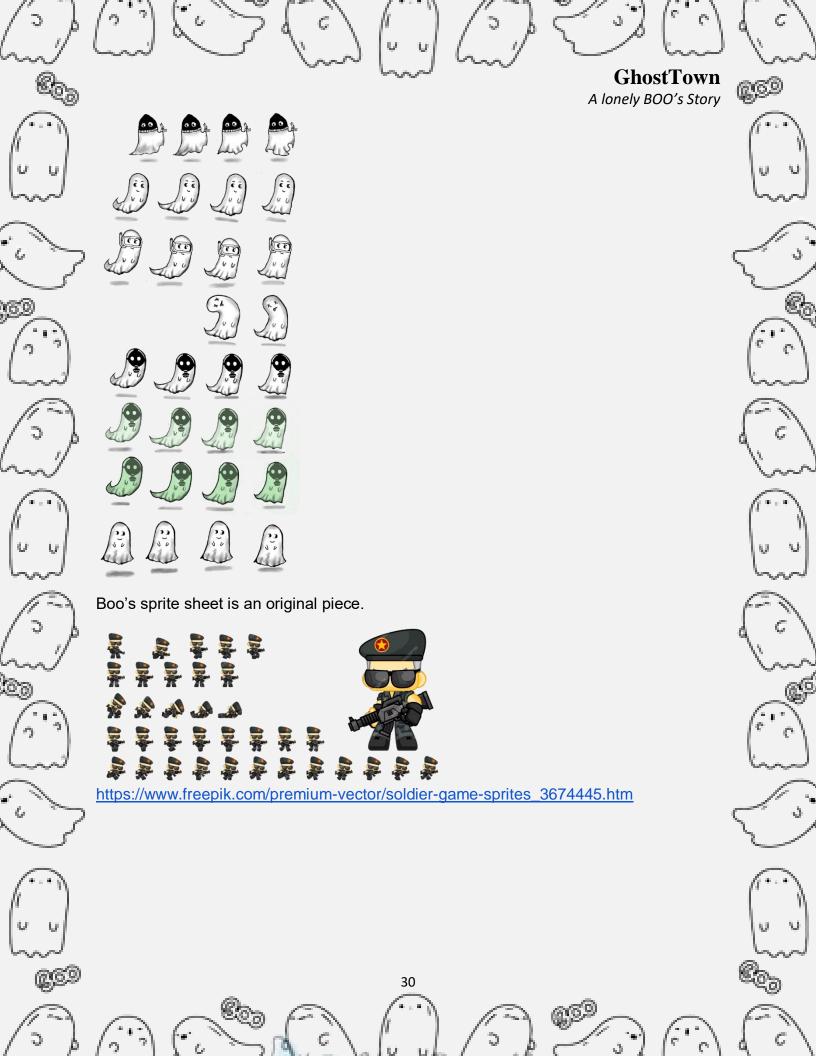


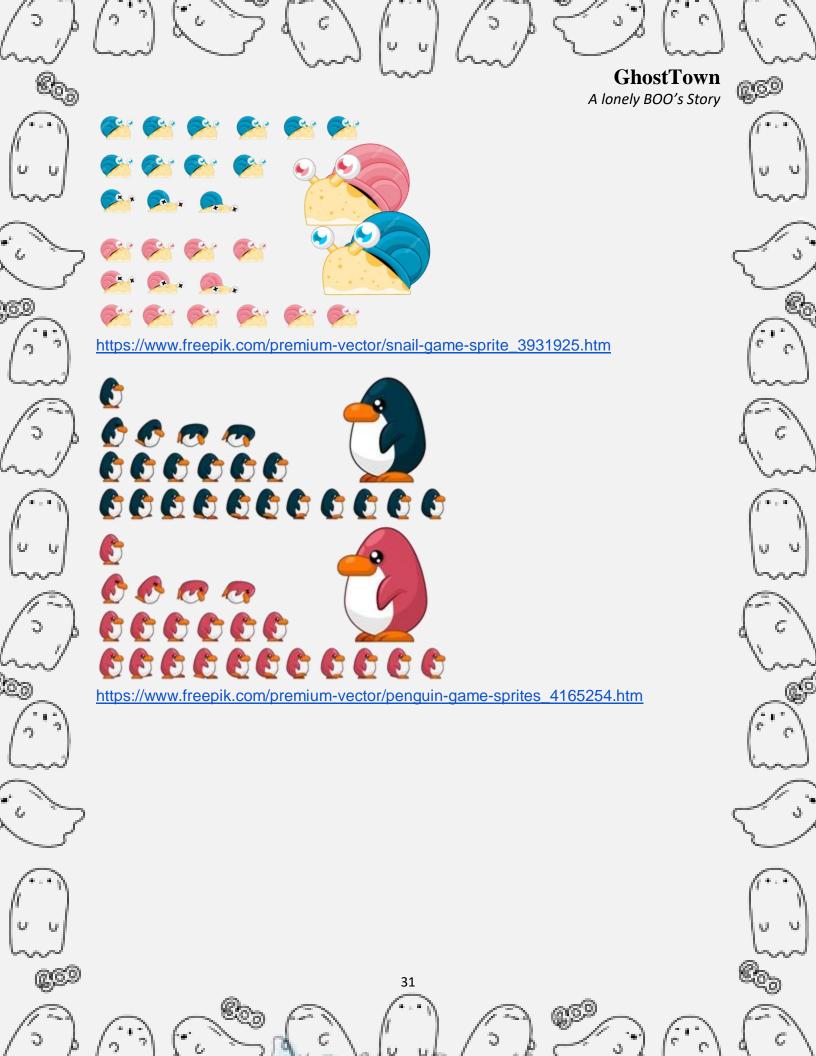


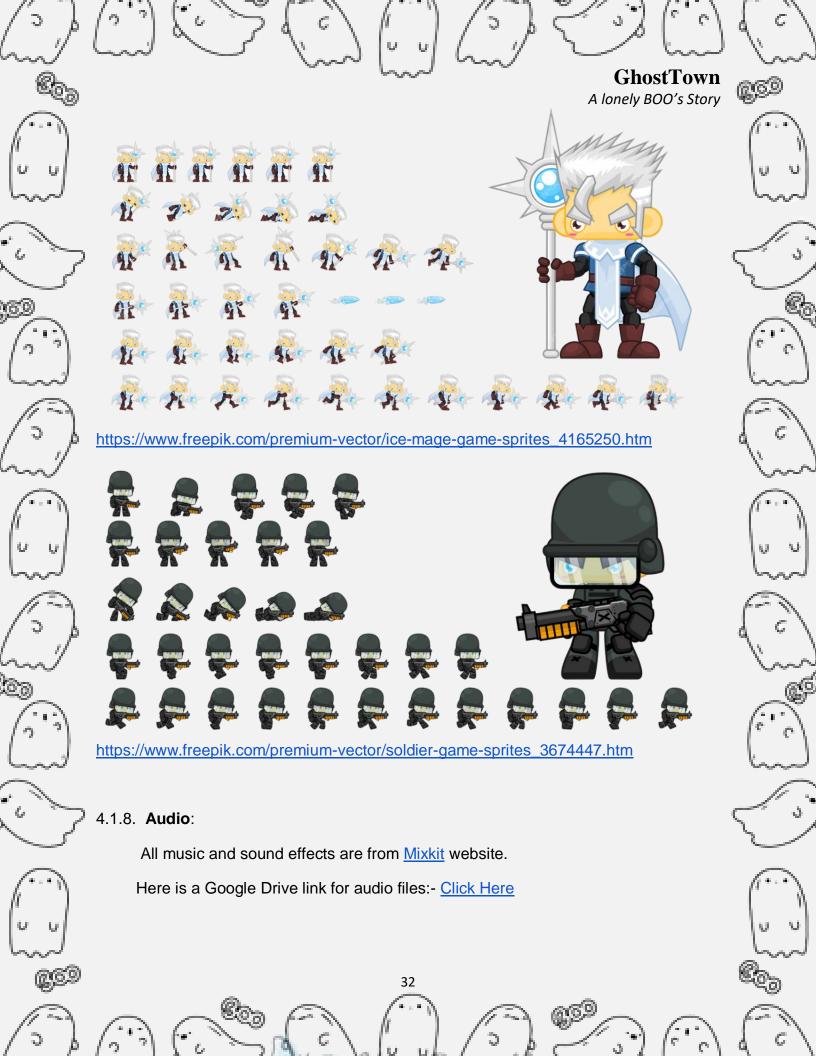














#### 4.1.9. Outcome:

The outcome of each level, the player gains the ability from the enemies specific to that level while also turning more people into ghosts. They may also gain new information related to the BooBusters on how to beat their bulletproof armour and get into their headquarters from the scientist. At the end of the game, Boo will fight off the BooBusters and would have turned all the people in the town into ghosts and fulfilled his goal of not being lonely anymore, turning HostTown into GhostTown.

#### 5. Dynamic Elements

When the player presses on "Start Game" he is taken to a cutscene of the backstory; the player watches scenes of two happy ghosts with a newborn ghost, and then a group of boo busters killing the two adult ghosts leaving the little ghost sad and alone, the ghost then has an idea for which he needs to build his strength and learn how to fight. Finally, the grand plan of killing the town civilians and taking their abilities is revealed and the cutscene ends taking the player to the beginning of the game. The player "Boo" starts the game on the main town road where he finds 3 buildings, and a pathway; a construction building, a police station, a path to the beach and the Boo Busters Headquarters. The player finds all the buildings and the pathway dulled down with blocked signs on their entrances except for the construction building which has a clear entrance.

The player enters the construction building and is first met by two construction workers who are throwing bricks at him at a constant rate (if the bricks hit the player, he takes damage and his health decreases) the player avoids the bricks by jumping over them and approaches the construction workers and punches them until they die. With every construction worker that the player defeats, the construction worker counter at the top of the screen increases. BooChifu then pops up to the player with a message informing him that he just gained the ability to go through brick walls and that he can select the ability through the down arrow. The player proceeds and pushes the pile of bricks on the ground over the hole, jumps over them and moves forward. He then goes up the slanted ladder and chooses the right time to get off of the ladder to the platform to avoid the construction worker at the top that is moving to the left and right. The player then punches him until he dies and when the player continues walking, he is met by a warning sign that says "WARNING! Active Construction Site" written on it to hint at danger ahead. The player then sees a grey shadow forming on the ground followed by a falling rock in the place of a shadow, he chooses the right time to pass through without getting hit by the rock and finds a brick wall that he



passes through using his ability only to find another construction worker behind the wall that he should also defeat.

The player then moves to another location in the site and finds horizontally moving platforms which he jumps on to avoid the cement on the ground underneath. If the player falls on the cement, he has to restart the scene. Then the player jumps on the crane moving a steel bar up and down to reach the upper platform where he is instantly met by bricks thrown at his direction by another two construction workers whom the player also defeats. The player then pushes the steel bar into the dip in the ground, uses the screwdriver to fix the broken ladder, sets it up, and uses it to go to the top platform. There, he uses his ability to go through the brick wall where the player has to avoid the bricks thrown on the other side by the final construction worker who he defeats to complete the construction workers count at the top of the screen.

The player then moves forward and is brought back to the town's main road where he finds that the police station is no longer dulled nor blocked and the player enters the station. The player is met by a dark room that has four entrances: the main door that Boo entered from, a locked door, a vent in the ceiling and an opened door. The player has to navigate through the room to reach the opened door without being detected by the policeman roaming the room with a flashlight, if the player is detected, he dies and restarts the level. The player then enters a new room in which he punches and kills the police officer eating a donut. This is where Boochifu informs the player that he gained the ability to shoot. The player then avoids the hot coffee spilt on the ground by jumping on the suspended boxes but is met by a missing box and two policemen which he defeats using his newly acquired shooting ability. The missing box will then appear, and the player will be able to reach the vent in the ceiling and jump into it. The player then descends through the vent back to the room with the officer with the flashlight and shoots him and a key is then spawned in place of the policeman. The player takes the key and uses it to unlock the locked door and go through it. The player then enters the final room in the police station. defeats the two policemen inside and then finds a lock on a prison cell which he unlocks by solving a sliding block puzzle. When the player enters the cell, he is met by a crazy scientist that was locked in the cell. He has a long conversation with Boo, and at the end of this conversation, the scientist agrees to give Boo the formula of a chemical that can penetrate the BooBusters' armours to defeat them. He also tells Boo about a secret entrance to the BooBusters headquarters that is underwater in the ocean that he should use.

The player is then taken back to the main road where he finds that the pathway to the beach is now unblocked and goes through it. The player is taken to the beach and a beach protection snail is immediately alerted to his presence and starts chasing him, the player has to finish the scene quickly before the lifeguard catches him. Simultaneously, the player has to quickly avoid the swinging floating rings while trying to move through sand which takes away his ability to



jump. The player then falls on the unstable surfboards on the water and balances on them to avoid falling in the water and then the player reaches the beach sand on which a penguin is present. The player then punches and defeats the penguin and Boochifu informs him that he acquired the ability to swim, but he warns him that he has limited time under the water before he runs out of oxygen and dies.

The player then dives into the water and is taken to an underwater scene and a timer indicating his breath level is immediately triggered. The player quickly navigates through the toxic waste in the water until he reaches the fishing net blocking the way and the camera is taken to a crab that was spawned when the player collided with the net. The player then goes back through the oil spills, swims upwards and avoids the vertically moving jellyfish to reach the spawned crab. He grabs it, takes it back to the fishing net and uses the crab to cut it and go through it. The player is then met by an opening and closing seashell with a lid inside, the player picks the time when the seashell is opened and grabs the lid inside. The player then takes the lid to the water pump and uses the lid to close the pump and stop the pressurized water that was blocking his way. The path now becomes clear and the player finds the secret entrance to the BooBusters Headquarters and goes through it.

The player then is transferred to the headquarters where there are suspended platforms with chemical barrels and BooBusters. The player has to collect all the barrels before the timer runs out and without getting detected by the BooBusters' red detection zones. All that while also avoiding the cracked parts in the platforms and reaching the vent in which he pours the chemicals collected. The player will then watch a cut scene as the chemical goes through the vent and the sprinklers start sprinkling the chemical on the BooBusters, killing them all. BooChifu then informs Boo that he has acquired his final ability which is the ability to absorb and release the deadly chemical on BooBusters. Boo then enters a hallway in which he collects the chemical barrels, and with every barrel that Boo absorbs, he becomes greener and greener. The player has to collect the barrels while moving through the slippery floor, avoid being struck by the static and rotating electrical rods and jump over the spikes in the ground. The player then moves down the ladder and is met by a BooBuster on which he has to avoid his detection zone and spray the chemical. The player then chooses the moment to jump over the spikes when the rotating rod won't touch him and spray another BooBuster. The player then has to jump over the ladder leading downwards and spray the BooBuster roaming behind it without being detected. The player goes down in the chemical barrel and takes the key then goes back to the ladder he jumped over and descends it to reach the lower platform level. He kills the last two roaming BooBuster and goes out of the main door of BooBusters Headquarters and to the main road. The player is met by a cutscene in which he watches the town after it is now full of ghosts keeping Boo company and Boo going over to the "Host Town" sign and adding a 'G' before "Host" so that the sign now says "Ghost Town".