Name: Dylan Gartin

Brainstorming the Game / The Game Design Journal – Gun Ball

# Objective:

To walk through a brainstorming session for creating a mechanic of a game, while also making and using this assignment to update the Game Design Journal as well as make this essentially the new and improved version of it.

# Phase 1: The Game Mechanic

## Main Mechanic Summary

The main mechanic with this game is a form of paddle ball 2D top down (meaning a ball being aimed at and bounced into the objects by a paddle like object) However, the ball and paddles have GUNS, in a way to combine the two genres. Both the player-controlled paddle and the ball can shoot at things. Below in the following section is a more in depth and detailed breakdown of the basic structure of how the guns would affect gameplay of each.

As for the minimum viable product this would be making a game demo with the above mechanics, while also completing the needs of the project listed under the “Final Project Assignment” under canvas.

## More In-Depth Breakdown of Game Mechanic

Below is an elaboration on more specific goals of mechanic -

The Player – The player is an object that you have main control over. Movement of this player is able to go up and down but not to the sides, and the player starts on the far left of the screen. However, the player would be faster than the standard ball speed. The players gun is rather weak (think like the starting weapon where it can work to deal dmg but pretty much anything is better, and it doesn’t have the highest fire rate) However the main goal of the players gun is to shoot the ball with it. This will redirect the ball and give it a speed and power boost that’ll be much better than your pistols damage normally. There is also idea to have foes that can only die to guns as well. Asl such the main purposes of the players’ gun are the following

* Hitting the ball – Pretty much already explained above but it a speed, power, and directional tool.
* Protection – it is an idea to have enemy entities that can shoot, and as such I feel this projectile should also serve to defend yourself from them, especially if I lean into less movement for the player.
* Sniping – take out foes not quite killed by the ball running into them, also perhaps having foes you don’t want the ball to hit either.
* Launching – after the ball hits the paddle, use a bullet to speed it up initially rather easy which still sort of falls under to hitting the ball.

The Ball – the ball is an object mainly controlled by the player indirectly, using the player object you will need to bounce the ball around in order to hit objects. The ball will have several of its own properties as well. Most notably, the ball itself has a gun as well. The ball can shoot a limited number of shots (if it had infinite shots after the initial send off it would never have to go back to the paddle again. This may also still happen since bullets from paddle may stop bouncing on it so trying to think of more reasons to hit the paddle (ref 2. Thinking On)) the main purposes of the bullets should be to redirect the ball midflight, similar to the purpose of the player bullets. They can also be used in other ways and I thought of a few techniques that might arise.

* Rush down – Using your bullets to slam repeatably into the same enemy in a row.
* Shot Gunning – bouncing into an enemy, then shooting them on the bounce back as a form of finisher on low health enemies.
* Snipping – While probably better with the player character, a quick snipe on a foe could be useful for the ball to do.
* Resting- using the bullets to shoot back the ball to the paddle to sort of hold and evaluate the situation. Kind of concerned this might end up over used in particular (where people just try and shoot with the ball the enemies while bouncing back into the paddle) I have an idea of how to stop this though with another mechanic for the ball, which is the next topic

Another thing I would like to give the ball is a BLOCK button, by pressing this the ball starts to block, which will prevent incoming bullet damage. This can be used to protect the player from gun fire while hiding behind it. Hitting the paddle puts this on CD, meaning while doing Resting mechanic your still open to gun fire, and once you finish a block, you’ll have to wait a bit to restart it. But you can maneuver the ball and paddle to make zones where your safe from gunfire. Another important thing to note is while blocking your damage with the ball is greatly reduced. This mechanic is more up in the air on the need of it, but it could be important.

## Other Mechanical Requirements -

Most of the other mechanical requirements are those seen within the Assignment Description of the “Final Assignment” as seen on canvas – These will be elaborated on within Phase 3: Game Features as they Fit Better with there and aren’t directly tied to the player.

# Phase 2: Game States

There are a multitude of variables that affect the game state. These will be grouped together by category of what type of object

## Player Game States -

These are game states related to the player -

Player HP – Current Health the player, and max Hp of the player

Player Paddle Position – The position of the player Paddle

Player Ball Position – The position of the player Ball

Player Paddle Speed – The speed of the player Paddle

Player Ball Speed – The speed of the player Ball

Player Ammo Capacity – The amount of ammo before there is a need to reload on the ball

Player Inventory – What items (if any) are in the players inventory, the capacity of such and what they do

Player Damage – Amount of dmg that individual attacks would do, such as running into an enemy, shooting an enemy, or using a power up.

Player Animation State – Current animation State of the Paddle Player object, if that animation locks there movement, and other variables related to such.

Player Control – Controls of the player paddle and ball, and how using these controls affect the game state

Player Aim – Where the cursor is aiming in order to determine direction of fire.

## Enemy Game States –

These are game states related to the three enemies -

Enemy Position – Where is the enemy located on the screen.

Current enemy state – The type of state the enemy is currently in, such as attacking and idle

Enemy type – What type of enemy is it?

Enemy Damage - – Amount of dmg that individual attacks would do, and how it can deal that damage.

Enemy Hp – the amount of Hp this enemy has.

Number of enemies – how many of these enemy are on the screen.

Boss State – Is the enemy a boss, and as such would this enemy have more than 1 basic attack?

## Power Ups –

Type Of states related to the five power ups that will be present in the game.

Power up Type – what type of power up is this.

Can be stored – Does the player have enough room to store this power up.

Item function – What does the item do when activated.

## Scene States –

What Scene – Which scene is the player currently at?

What is the next Scene – What Scene comes after this one?

Has Cleared – If level has been cleared or not and actions needed after clearing one.

What level – If a gameplay Scene, what level is this?

Music – What music if any plays during this scene

Menu – If this scene is the menu, or another thing

Cutscene- If currently there is no player control due to a cutscene.

## Object States -

These are general states that can be applied to most objects

Has Collision – Object can or cannot be collided with

Is destroyable – If the object can take damage or not from attacks

Sound effect - Sound effect associated with this action or state that occurs

## UI States –

The UI will have the information from several other game objects – Thus the state of the UI will change based on the following varibles from other categories being:

Player HP –

Player Ammo Capacity -

Player Inventory –

Player Aim -

Boss State –

Enemy Hp – (Used for bosses)

What level –

These variables will be reflected within the UI Design to match that of the currently which is occurring within a scene

## Gun states -

Projectile – what type of object is shot

Projectile speed – How fast is the projectile and what direction is it going

Projectile damage – How much damage would this deal and who is it dealing dmg to?

## Other -

Types of game states that don’t really fit into any other category-

Decorations – a type of object that doesn’t affect game state but helps world building, only affects game visual state.

Camera - What is the Camera Positions, size, and what is it showing.

## Unforeseen Game States –

This is a section used to future proof and add in game states that were thought of after leaving this section and that which were thought after the initial design for previous objects the document or added in due

# Phase 3: Game Features

What follows is a list of the main features – The Table gives a basic overview of the items present. Then the Breakdown elaborates on what each feature is suppose to be cable of.

## Table of Feature Set

Below is a simple table explaining the games main features

|  |  |
| --- | --- |
| Game Features | |
| Feature Name | **Feature’s traits and need** |
| Moveable Player | Movement, Aiming, shooting, HP, Attacks, use of items, |
| Ball Player | Movement, Aiming, shooting, Collision |
| Enemy Type 1 | Movement, Aiming, shooting, HP, animations, Attacks. |
| Enemy Type 2 | Movement, Collision |
| Enemy Type 3 | Movement, Aiming, shooting, HP, animations, Attacks. |
| Levels | 3 gameplay levels, 2 starting stages, and after 1 with a boss, Start Menu, Options Menus |
| Inventory Items / Power up crate | 5 Items that each do different functions that come out of a destroyable object |
| Miscilanious | animations |

## Breakdown of Feature Set

### Moveable Player –

Similar to how it was discussed under Phase 1 this is the first Main Player object and will have the following features

Simple horizontal movement - a basic movement to the right to transition between parts in a stage.

Good Vertical movement – A decent set-up of vertical movement, the main player movement the paddle will be doing

Shooting ability – Player can shoot a projectile to the current mouse location. If bullets hit bullets they are destroyed. If bullets hit the other player they bounce, if bullets hit an enemy they take chip dmg.

Use of items - ability for the player to push a button and use an item.

HP – an hp shared that takes different dmg depending on which player character is hit.

### Ball Player

Similar to how it was discussed under Phase 1 this is the second Main Player object and will have the following features;

Ball Like movement and collisions – This player character will move like one would expect a ball would

Shooting – will be able to shoot up to 6 bullets. Player can shoot a projectile to the current mouse location, and this will also apply knockback to the ball in order to change it direction to be the opposite direction of what was shot.

Collisions – Colliding with an enemy deals a lot of dmg if the enemy is of the right type.

### Enemy Type 1 –

This is the first and most basic type of enemy, this enemy main function is 5 things;

Idle – It won’t be doing anything

Moving – On random roll, it will choose to move in a direction that it is cable of moving to, if it can’t move where it wants to it will instead just stay idle

Fire – On a randomly set interval this target will fire a small bullet at the player, then the moveable player must either fire back to intercept the projectile or dodge it or they will take (X) Damage. It it hit by the ball the player instead takes (x-y) dmg which would be much less dmg

Hit – Enemy is hit by a projectile and takes dmg losing (x) hp if it is hit by the ball the enemy takes (x-y) dmg which would be much more dmg

Death – If the enemy Hp falls to 0, play a death animation and die.

### Enemy Type 2 –

Similar to the first enemy the second one is also one of the most basic type of enemies, this enemy main function is 5 things;

Idle – It won’t be doing anything

Moving – On random roll, it will choose to move in a direction that it is cable of moving to, if it can’t move where it wants to it will instead just stay idle

Collision Attack – This object instead deals dmg to the player if the ball collides with the object. If hit by the ball the player instead takes (x) dmg which would be more damage then usual, and also this object then takes no damage from the collision.

Hit – Enemy is hit by a projectile and takes dmg losing (x) hp

Death – If the enemy Hp falls to 0, play a death animation and die.

### Enemy Type 3 –

This is the more advanced and strongest of the enemies with 3 different attacks. As such it has the following features

Idle – It won’t be doing anything

Moving – On random roll, it will choose to move in a direction that it is cable of moving to, if it can’t move where it wants to it will instead just stay idle

Fire – On a randomly set interval this target will fire a small bullet at the player, then the moveable player must either fire back to intercept the projectile or dodge it or they will take (X) Damage. It it hit by the ball the player instead takes (x-y) dmg which would be much less dmg. This attack is done in a 3 spread to mimic that of a shotgun and as such takes up more area then the other attack done by enemy 1

Fire Spikes – This attack sends an object rolling to horizontally across the screen based on this enemy current position, this object then rolls till it get to the other side, and if it hits either the player or ball they’ll take a lot of damage

Summon Enemy – an attack that is done to spawn in 1 of each of the following – an enemy 1, an enemy 2, and a power up crate with a random item.

Hit – Enemy is hit by a projectile and takes dmg losing (x) hp

Death – If the enemy Hp falls to 0, play a death animation and die.

UI – Info on the boss hp Via the UI

### Level-

These are the items tied to the type of levels and scenes that need to be present within the game –

Menu Level – this would be a starting menu that would display the title, a start button and a button to work options. Start button will go onto the gameplay scenes, meanwhile the options buttons goes to another panel which will allow you to adjust settings, (most likely sound settings but TBD at this time)

Gameplay Levels – These are the levels used for gameplay, broken into 3 scenes.

Scene 1: Introduction to basic enemy and mechanics as well as items.

Scene 2: learning and facing same enemies but harder challenges and layouts to those foes.

Scene 3: A final Showdown with the leader of these foes in which you have to use what you learned to beat them

Changing Between Stages in scene – Horizontal movement done in a scene to change movement.

UI – Info on current level and location via UI

### Inventory and Crate

This is how the powerup and inventory items within the game works;

Crate – a game object that upon collision spawns 1 of 5 various objects to help the player

Heal – Heals player hp by an amount

Bullet – reloads ammo

Shield – Makes briefly immune

Skull – Spawns a big bullet that deals massive dmg to foes

Sphere – Duplicates the ball, the next hit on ball deals no dmg, but destroys the extra ball

### Miscellaneous

Any Extra game features thought of after the initial design go in this area.

Animations – Any and all animations needed for the above items

# Phase 4: Board game

The Following is the results that occurred with the simplified board game version of the game. First are the rules of the games if you would like to test it yourself and then also the results from the experiment.

## Board Game rules –

In order to keep my board game simple, I designed it as a simple two player game where you work together to defeat the boss like enemy of the game. Player 1 is the paddle and player 2 is the ball.

### Items needed for the board game

Graph paper

A Pencil

An Eraser

Two dice

### How to set – up

First draw a 12 by 25 grid – Place a square on the top left square and a dot on the grid square directly to the right, (you can also cut these out for ease of use or simply draw and erase based on your new location)

On the right side of the board make a 3 by 3 triangle on that side of the board. This is the boss enemy

With that your set up to play the game.

### How to Play –

Each Player Rolls a dice and can then move on the board based on the following rules –

Player 1 – Can move any position above or below themselves as long as it is in bounds, up to the number on the dice

Player 2 – Can move in any direction they choose up to the number on the dice, but to change the direction they are going they must be going to a space occupied by another object or spend 1 bullet point, which changes their direction and spawns a bullet on the opposite side of there new direction.

After moving Player 1 can also choose to spend 1 bullet point to spawn a bullet, if player 2 collides with the bullet then they can change direction, and the bullet is destroyed.

Each player has a total of 6 bullet point and must wait 3 turns without using a bullet point to get them all back.

Then it the enemy turn, which you roll a dice to see what it will do.

1-2 - will shoot 3 bullets on the squares currently in front of it, that travel horizontally

3-4 – Will move up or down based on a coin toss, head is up tails is down, if it cant move down or up it stays where currently at.

5-6 – Spawns another smaller (1 by 1) enemy on a random square ( Up to you how it chosen) This enemy will also fire a single bullet horizontally if a 1-2 is rolled while it alive

Bullets - For all the above characters bullets will go 1 space in the direction that they initially spawn into base on there play position, and after hitting a wall or player/ enemy they are destroyed If a bullet hits another bullet then they both are destroyed. If a player or enemy is hit they will lose 1 hp. The two players share hp pool, and the hp pool of the objects are below.

Players’ shared hp pool - 6

Main Enemy hp pool – 10

Spawned enemy – 2

Also, if player two collides with a space occupied by an enemy, they take 2 damage and then player two can choose a new direction facing away from the direction they hit that enemy.

The player win if they beat the main enemy before losing all there hp, and the enemy wins if it does the same to the players.

## Board Game Test Results –

The results of the test, which was done with a friend of mine, showed some interesting results, most notably were the following items;

* Enemy spawned felt rather weak and might be good idea to make more
* Some confusions on the rules, mainly how the collisions worked. Rules were updated to reflect this.
* Random speed element feels dumb and also the random chance to get shotguned by the enemy without any warning is annoying.

The main things that I have learned from this is essentially the players didn’t like the more random elements of the game that punished the players and I could define the rules better. As such there will be more elaboration within the games instructions that show up, as to avoid confusion on the players. Also, I should make some long and telling cues about what the boss should do, in board game form perhaps making his roll the next action he would do on the next turn instead of this turn, so that way the players have a way to react.

Other thing to note of interest is that due to the bullet slow speed there would be a lot in the game at a time from the slow speed, so making bullet speed faster could be good idea if similar thing happens within the real game. Also, one of the mechanics I predicted came up in the game, which was using the ball’s bullets to change direction back to ramming the boss again. This made me happy because I wanted to see it be used, however it did melt through the rest of the boss hp when discovered, would be best to raise his hp so even with this strat you only deal big dmg rather then outright be able to kill him. Other then that most of the mechanics worked about how I thought they would and as such I am happy with the current results.

# Conclusion

Overall, I think I now have a very firm grasp on the game mechanic and it features, though not on the exact numbers that’ll be needed for the final product. As such, hopefully I’ll be able to soon test the game out itself with protyping.

# Epilogue

Note: Some sections here may need additional elements, due to oversights, new design implementations and other factors, document is subject and willing to be changed, before and after submission