

Battleship Brick Breaker

Game Design Document

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Game Concept

Battleship Brick Breaker is a PVP, physics-based game which will be primarily designed to be played on mobile devices. The game involves two players who battle to destroy the bricks laid out before them. They will remove these bricks using a ball (see game *Brick Breaker* for reference). Each player will control their battleship which will act as a paddle to launch a ball as well as keep it in play, similarly to how a ball is hit back and forth in *Pong*. The goal of the game will be to destroy all of a specific type of brick from the layout of bricks presented to them. The first of the two players to reach this objective is the winner of the match.

Players will be able to handicap their opponents via firing projectiles at them from across the arena from their ship's designated artillery. Different ships might have different types of weaponry which may be used for this purpose. The consequences of landing a projectile may include things like sinking the opponent's ship wherein they cannot affect gameplay for a set period or other penalties depending on the type of artillery or ammunition used. Ammunition will be gained via breaking certain types of bricks which grant it.

Other types of power-ups may be gained via breaking different types of bricks within the arena. These power-ups may come out right from the player breaking a specific kind of brick or from the player catching a collectible with their ship. Power-ups may also be used to handicap the opponent in a similar way to the projectiles.

Current Feature List

- 2-player, local PVP brick breaker gameplay (Mobile)
- 3 unique handicap mechanics
- 7 unique achievable powerups
- Projectile firing capabilities from player controlled ships
- System of menus (Main menu, Pause menu, settings menu etc)
- In-game Tutorial
- Tutorial pages
- 5 unique levels

Game Theme

As the naming of the game suggests, the theme of the game should be naval battleships or possibly pirate ships (or both). The player will control a specific type of ship which they have chosen beforehand out of a selection of different types of naval battleships which each have their own design (possibly based on existing models). The art style of the game, in general, should be light-hearted and cartoon-like to allow for different types of ships to coexist

without it looking out of place. For instance, futuristic, space-themed ships should be able to not look too out of place next to a classic pirate ship if possible. A good example of a game that achieves this type of art direction is *Bloons Tower Defence 6* (see figures 2, 3 and 4 for examples). Graphics may be a mix of 3D models and 2D sprites.

The surrounding levels should maintain an ocean/beach theme to go alongside the battleships. This may include things such as the arena being styled to look like the sea and bricks being made out of things like coral or rock. Things that may slightly break this theming may be allowed for gameplay mechanics but they should be kept as close to the theming as possible.

The objective of the game should also find a way to be tied to the theme of the game. An idea for this would be that the objective bricks that the player has to break are wooden planks that come together to form a suspension bridge to collect a treasure chest. This would be displayed along with the UI which sits above the gameplay arena to indicate how far along each player is to reach the objective.

Level Design

Each level should include a unique layout of bricks that is the same on either side of the arena to ensure that each player is on a level playing field. Figure one displays an example of a potential basic brick layout (ignore the fact that the different-coloured bricks aren't even on both sides, this is just to illustrate a basic layout). Ideas for objects placed around levels that influence the ball's trajectory may be included if it serves the overall level design. Different levels should provide different challenges to the player through the different brick layout designs.

Power Ups

- Increase ball velocity
- Add in 1 extra balls which split from initial ball (disappears upon going out of play)
- Increase length of paddle
- Bomb to throw at bricks or opponent (area damage)
- Triple cannonball shots
- Passive Snowball throwing
- Enable barriers which help keep ball in play

Different Kinds of Bricks

- Basic brick (does nothing) (3 tiers of strength)
- Power Up brick (drops random powerup upon being broken)
- Ammunition brick (Drops ammunition upon being broken)
- Objective brick (break to achieve the goal)
- Explosive brick (deals damage to surrounding bricks)

Adoption of the Oscillating Aiming Mechanic

Initially, the idea was that the players would choose the direction they wanted to launch the ball by manually dragging a line renderer to point in the desired direction. The ball would be launched from the paddle when the player would release their finger from the touch screen. This initially was a perfectly functional way of going about the aiming mechanic and offered a high level of control but I found it was the best for fast-flowing gameplay. The control scheme whilst working on mobile devices didn't provide the best experience when operating. This was the approach I found most brick breaker games acquired when deploying their game on touchscreen mobile devices. This style of aiming had come about from the initial control scheme implemented on blackberry devices which used a trackpad which allowed the player to precisely determine the direction they wanted.

The oscillating aiming mechanic provides a smoother and less input-heavy way of aiming whilst removing some control from the player. An aiming arrow appears which points in the direction in which the ball will launch into the arena. The arrow proceeds to oscillate back and forth between a minimum and maximum aim angle and the ball launches in that direction when the player taps the screen. The speed at which the arrow oscillates can be tweaked to alter the level of difficulty involved in operating this mechanic. Playtesting data should be used to determine a good speed to settle upon.

Change to Button Movement System

The initial slider movement system was found to be relatively unengaging through playtesting. It gave the players lots of control of where they moved their paddle but it made it difficult to create challenges within this aspect of the game. It was sometimes observed that players would disconnect from the game entirely whilst they were waiting for the ball to come back toward the paddle. The slider system was initially used as it is commonplace for brick breaker games which are designed for touch screen devices.

The new button based approach forces the player to engage with where the ball and paddle are located in the arena. They must hold down the buttons to drive the paddle left or right. This allows the challenge to be controlled partially through the speed of the paddle movement. Consequently, this allows for the handicap mechanic of being able to slow your opponents paddle down which is used in the snowball power-up. The movement uses animation curves to allow the paddles to accelerate up to their top speed and slow down to a halt. This is mainly for the sake of game feel.

Introducing Open Mode

During the design process, it was decided that for the purpose of level design and quality of gameplay to remove the middle piece which divides the players into two separate sections. The players will be contesting for the same bricks and will be able to keep the opposing player's ball in play. This dramatically changes the way levels are designed as it allows for more space inside the general area.

Since players can hit the ball that was launched by the opposing player in the scenario, it also allows for a new competitive aspect to be added. The last player to hit a ball with their paddle gains the benefits of the bricks which it breaks. This means that if a player can keep both balls in play, they gain an immediate advantage and the opposing player cannot affect the bricks until either the ball goes out or it lands back under their control.. This creates a situation for them to also potentially use their artillery to handicap the opposition in a bid to take back control by handicapping the opponent.

Handicap Mechanics

Cannon Balls

The standard handicap mechanic which has been part of the game since its conception, the player builds up an ammo count of cannonballs by destroying the ammo bricks in the arena. These bricks are black to match the colour of the cannonballs. The player fires cannonballs over to their opponent's side of the screen by tapping the cannon button which appears when they have ammo. Upon colliding with the opponent, cannon balls sink their ship which disables their movement and ability to hit their ball for a set handicap period. This Handicap period may stack upon being hit by multiple cannon balls but will not extend beyond a maximum limit.

Upon landing a cannonball, the player's ball is ignited and the text fireball flashes up on the screen. Whilst the ball is on fire, it does double damage to bricks for a brief period which stacks every time a cannonball is landed. This is intended to incentivise handicapping your opponent.

Bombs

Bombs are obtained by grabbing the corresponding power-up. When obtained, the player will see a bomb image appear in front of their paddle and a bomb button appear next to the cannon button (as seen in figure 6). They can hold down the bomb button to power up the bomb throw. A target graphic will appear to indicate where the bomb will be thrown. The bomb deals area damage to the bricks where it lands. If the opponent's paddle is caught in its area of effect, they will be disarmed and unable to move or hit their ball (similar to the cannonball effect but for a different down period).

Snowballs

Snowballs are passive power-ups which are obtained by grabbing the relevant power-up consumable. Once obtained the player automatically fires snowball projectiles in the opponent's direction. The player fires a snowball periodically until their ball goes out and their power-ups reset. Landing a snowball on the opponent's paddle slows down their movement speed for a brief period.

Control Layout

The control layout for the game will be fairly simple since the game only involves a few mechanics. The game will be developed to run on both mobile and PC platforms so it will have a slightly adjusted control layout depending on the platform the game is built for.

Aiming on PC and Mobile

The way in which the player aims the ball upon launching it into the arena has been altered to become more mobile friendly. Rather than specifically aiming an arrow where you want with a scroll wheel or touch controls, the arrow will be rotating back and forth continuously and it will be upon the player to press the button when they want it to stop and fire in the current direction. This will likely be bound to the left click on PC and a single tap on mobile.

Mobile Layout

Players on mobile platforms will move their ship paddle up and down the arena using a left and right button. This will move the paddle at a given speed in the direction specified.

The player will be able to operate the artillery by tapping on a button which appears above the arena on their given side when they have ammunition available. This might be a slightly awkward setup if the user is holding the device with both hands so alternative layouts will likely be tested to potentially improve this.

PC Layout

Players on PC will be able to move the paddle left/right by holding down the up/down arrow keys rather than on screen buttons.

The player will be able to operate the artillery by pressing the spacebar on the keyboard when they have ammunition available. A prompt above the arena will indicate when this is possible. Bombs will have a dedicated button which the player can hold to power up. This will likely be the shift button.

Communication Design

Communication of the different aspects of the game will mostly be handled by the user interface. As can be seen in figure 5, this will involve a bar across the top of the screen which indicates to the player(s) how far each side has progressed with regards to the objective, how much artillery ammunition they have to use as well as a button which allows them to fire their artillery (when ammunition is available). For online play, this could also potentially include a small amount of profile data for each player (profile photo, username etc).

Different power-ups that the player can obtain throughout a game session will be designed to be self-explanatory. Once the player obtains them, they should be able to quickly understand their effects. All of the power-ups should be useful to the player so there should be no reason for them to avoid any of them.

Various events which occur during gameplay are communicated to players with either flashing/floating text or iconography. The purpose of this is generally to draw the player's attention to certain mechanics or to communicate gameplay changes. Examples of flashing text include the triple cannon power-up event wherein some text displaying "Triple Cannon" and sound comes up to notify the player this power-up is now active. Also when one of the players achieves the objective, some text-reading winner appears on the side of the winning player. The frequency of this flashing text is kept slower than 50Hz to ensure it isn't problematic for players with epilepsy.

Examples of floating text at this stage revolve around notifying the player when they have gained ammunition for their cannons. When an ammo brick is destroyed, some text displaying "+1 Ammo" floats up above the location of the brick. This is accompanied by a "+1" floating text which floats above the cannon button. This is intended to notify the player when they gain ammo and it is accompanied by a ding sound.

Tutorial Design

The game's tutorial comes in two separate forms. The first is a collection of subtle button prompts which appear during gameplay and point towards the various UI buttons which the player uses to operate the machinery. These include animations and flashing effects to get the player's attention. These can be seen in figure 6. The second form of the tutorial can be found on the main menu screen. It is an in-depth breakdown of everything the player needs to know about how to play the game. It is composed of 4 separate pages that the player can cycle through. These pages can be seen in figures 7-10. The order of the pages is intended to explain the most important aspects of the game first. Each page includes a layout of text boxes which each explain a specific aspect. Each text box is accompanied by a related graphic for a visual representation of what is being described.

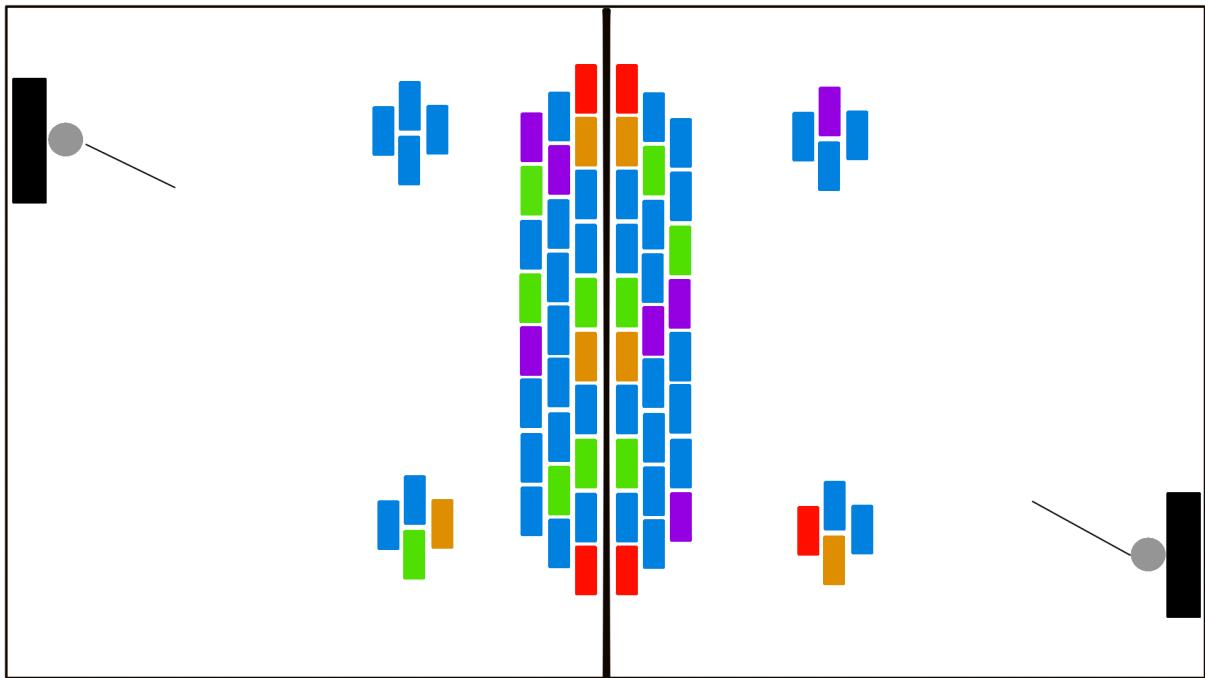


Figure 1: A Basic Level Brick Layout (With central dividing wall)



Figure 2: Monkey Buccaneer from *Bloons Tower Defence 6*



Figure 3: Super Monkey from *Bloons Tower Defence 6*



Figure 4: Wizard Monkey from *Bloons Tower Defence 6*

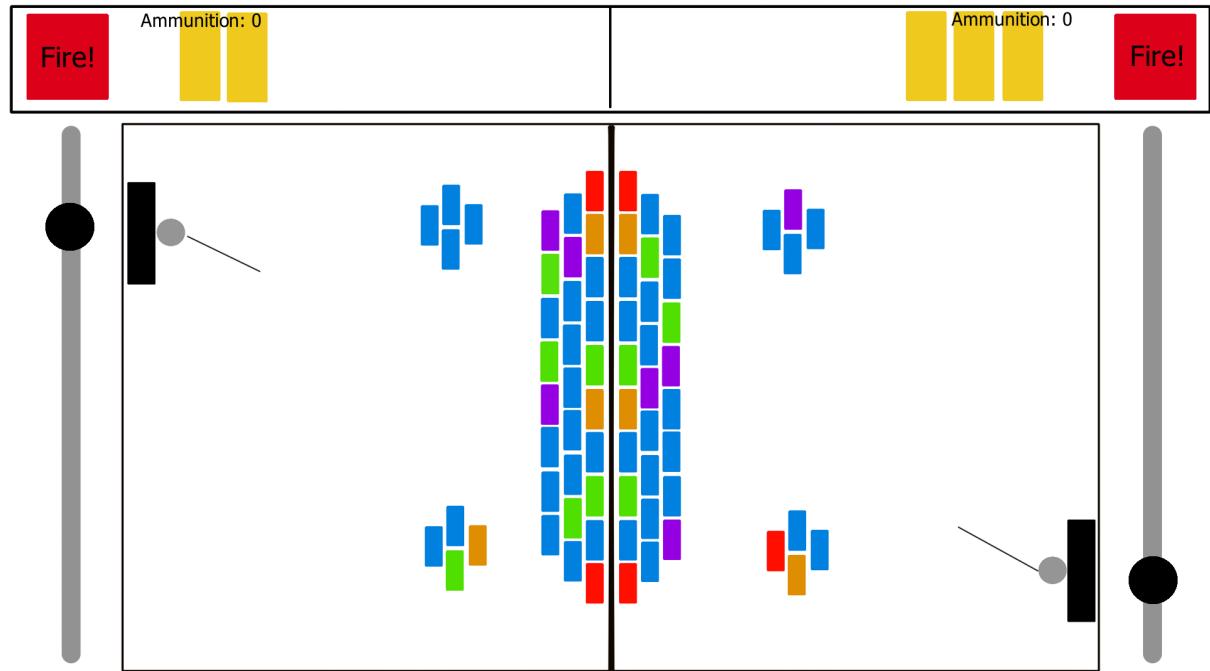


Figure 5: A Basic Level With UI

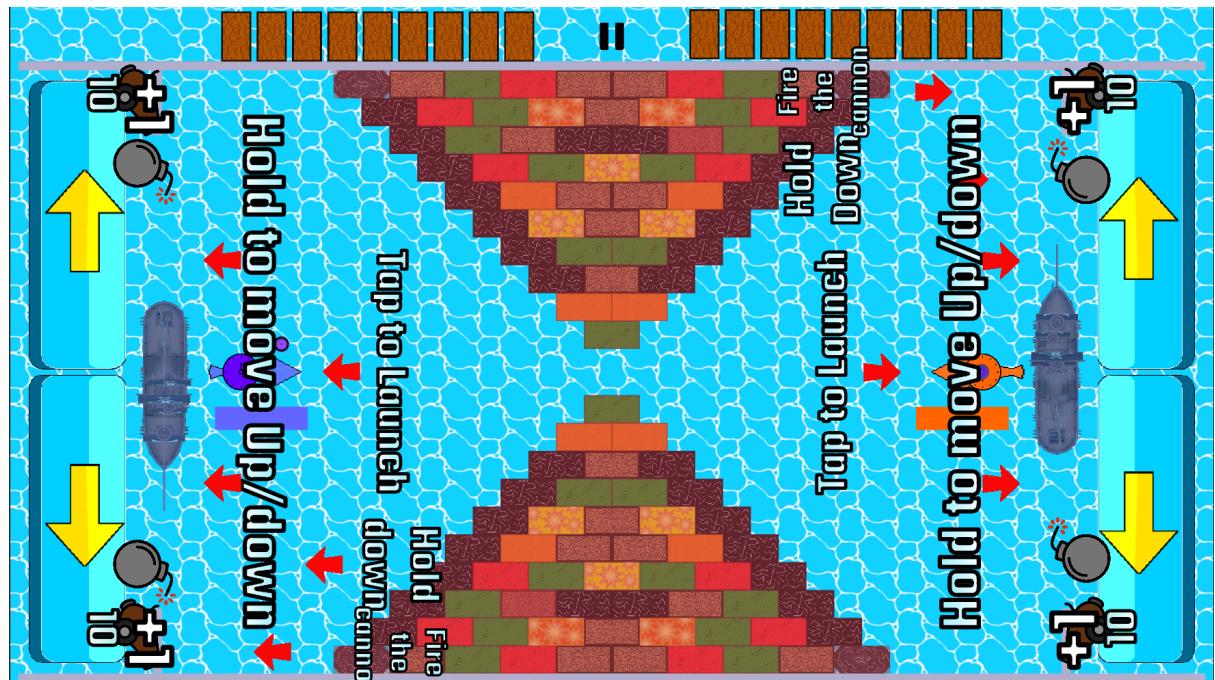


Figure 6: Development Screenshot with all tutorial text enabled

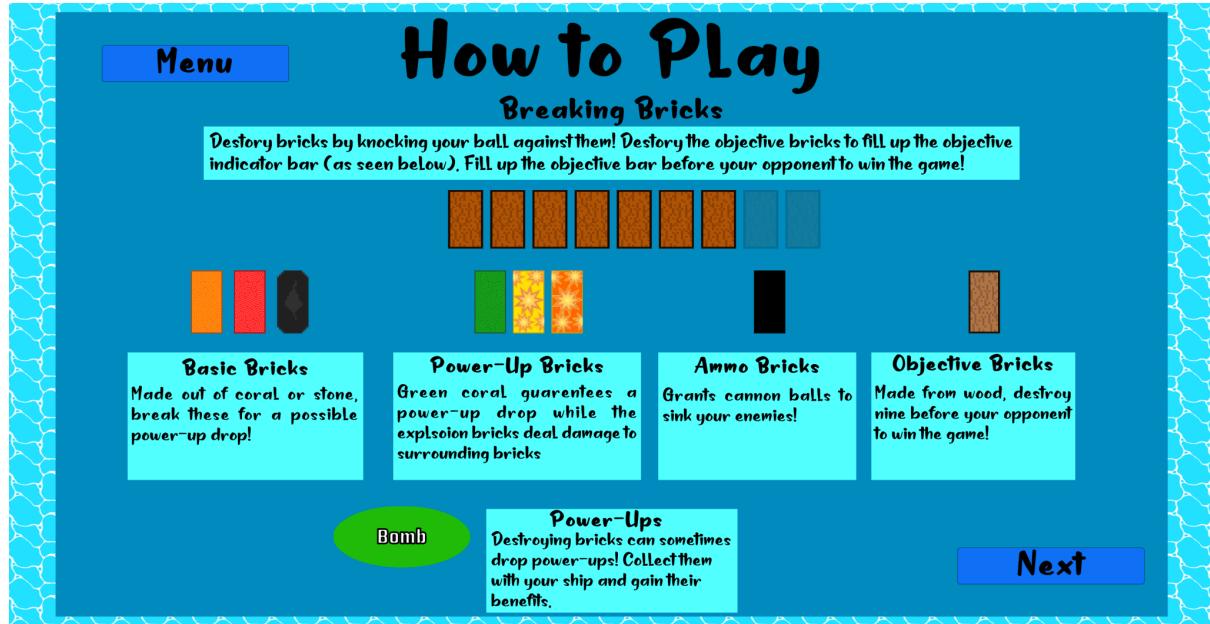


Figure 7: Breaking Bricks Tutorial (First Page)

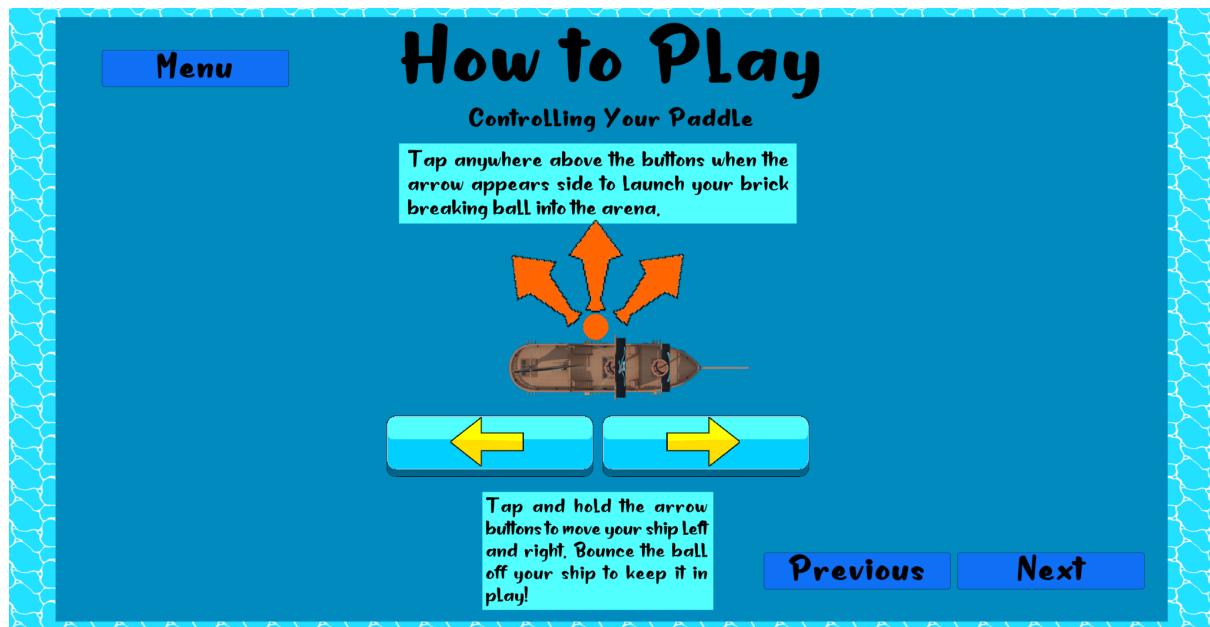


Figure 8: Paddle Control Tutorial (Second Page)

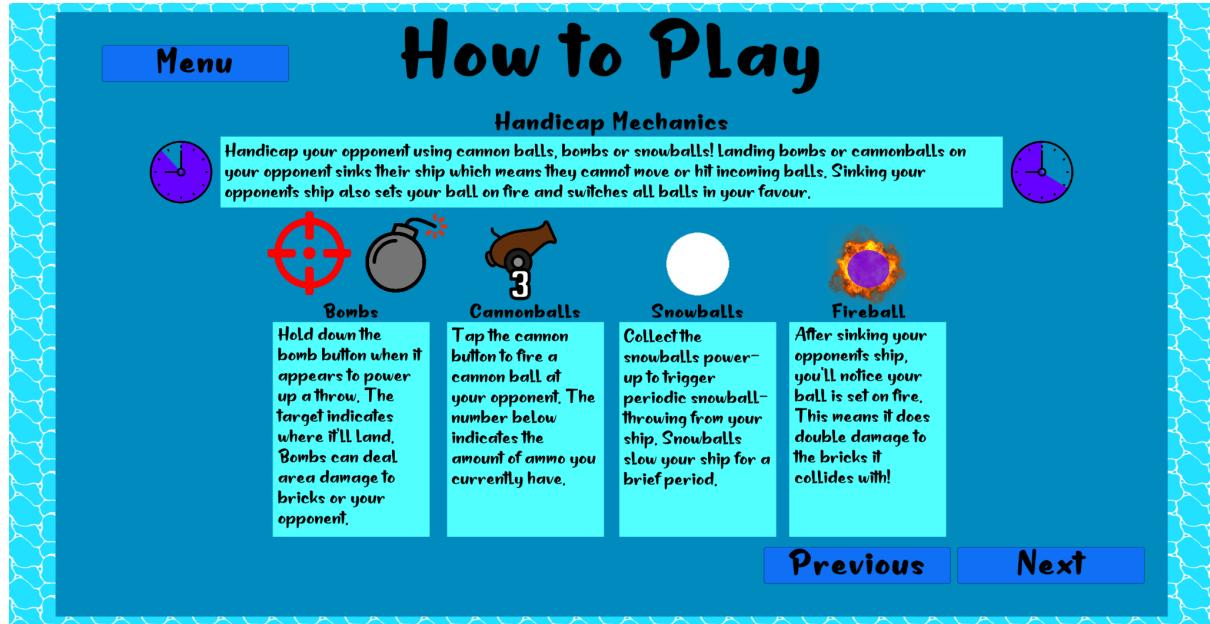


Figure 9: Handicap Mechanics Tutorial (Third Page)

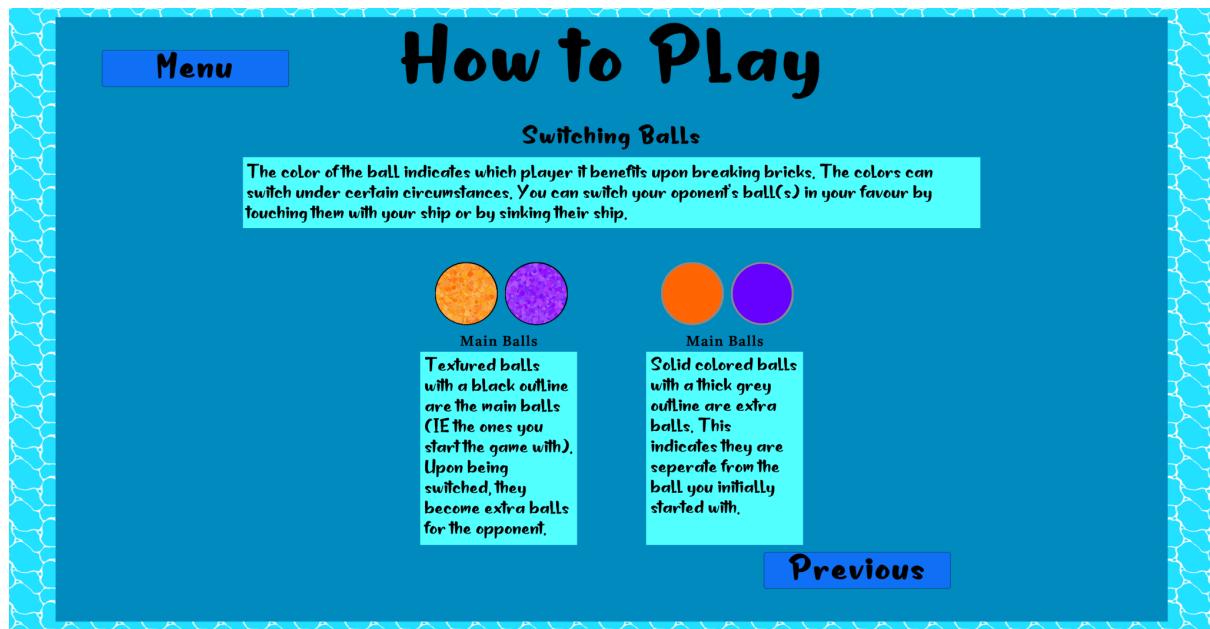


Figure 10: Ball Switching Tutorial (Fourth Page)