

Game Design Document

# **Dash n' Smash**

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## High Concept

Dash n' Smash is a 2D PC title offering fast paced action combat against your friends in local multiplayer arena combat. Two to four players are pitted against each other to duke it out in a single screen arena. Player compete to be the first to reach the deathmatch kill limit by repeatedly dispatching their friends.

## Game Rules

These rules govern the gameplay and processes that will occur during the game.

- Free for all combat.
- Two to four players required. Combatants are all player controlled.
- Deathmatch. Players will continuously respawn until the game end conditions are met.
- Game ends when a player reaches the set point limit.
- Points are earned by slaying enemy players.
- Only one Power Orb effect can be active on a player at a time.

## Gameplay Elements

### Arena

Arena environments are setup as multi-level platformers. Players will navigate the space by jumping between platforms. The arena will be viewable in its entirety on a single 16:9 ratio screen. All areas of the arena should remain on screen at all times. Game will release with one arena.

### Scalability

- Hazard areas. Arena may include hazard areas such as acid pits and spikes to add additional obstacles for the players.

### Players

Players are identified by fighter characters each differentiated by a unique colour palette. All player characters possess an identical set of abilities to be utilised in combat.

### Attributes

<b>Health</b>	Defines the amount of damage a player can sustain before dying. Health will be set very low to allow for 1 shot kills. Health has been implemented as an attribute to allow for greater control should the 1 shot kill mechanic prove to be unsatisfactory.
<b>Movement speed</b>	Defines the movement speed of the player.
<b>Damage</b>	Defines the amount of damage a player deals. Utilised by Punch ability. Damage will be set high to support 1 shot kill design.
<b>Jump height</b>	Defines the height a jump will travel.
<b>Dash distance</b>	Defines the distance the player can Dash.
<b>Block duration</b>	Defines the duration block will last.
<b>Resource Max</b>	Defines the max resource a player can store.
<b>Resource</b>	Defines how much resource a player currently has.
<b>Resource regen rate</b>	Defines the rate at which a player regenerates resource.
<b>Resource regen delay</b>	Defines the period a player must wait before regenerating resource.

### Abilities

- Movement
- Jump
- Dash
- Block
- Punch

### Scalability

- Throw
- Beam

### Power Orbs

Power Orbs are NPC characters that wander the arena with AI governing random movement. Power Orbs are collected by player characters on contact. Power Orbs provide a temporary boost to the player that interacts with it.

- Power Orb Types
  - Movement speed boost
  - Shielding
  - Resource regeneration increase

### Scalability

- Power Orb Types
  - Death aura orb

## Game Mechanics

The following is a comprehensive list of game mechanics that detail general gameplay, the interaction between players, and the arena.

### Scoring

- Players earn points by slaying enemy players.
- One kill equates to one point.
- Points are not lost for self-inflicted deaths.

### Arena

- Spawning
  - Players will spawn at random locations which are predefined for the given arena.
  - Power Orbs will spawn at random locations which are predefined for the given arena.

### Scalability

- Hazards
  - Spike pit. Player will die instantly upon contact with a spike.
  - Acid pool. Player will die instantly upon contact with acid.

### Player

- Movement / Aim
  - Players will navigate the arena with horizontal movement while jumping to gain elevation. Players are affected by gravity and will therefore fall after reaching the peak of a jump, or when not supported by an arena platform.
  - Aiming will be handled in a full 360 degrees around the player. Both movement and aiming are handled by the same controller thumb stick. Aiming is primarily utilised by Dash.
- Jump
  - A stationary jump will launch the player vertically. A jump can be guided by performing left or right movements at a reduced influence.
- Resource
  - Resource is required to perform combat actions. Resource regenerates passively over time. Resource regeneration will begin 2 seconds after the last performed resource spending ability. Resource is regenerated at a rate of 1 charge per half second. Until max charges is reached or a resource spender is used.
  - Players have 4 charges at max.
- Dash
  - Dash the player forward in the current aiming direction. Players are invulnerable for the duration of the dash. If dashing directly into a collision object, the dash will end prematurely.
  - Expends 1 charge resource.
- Block
  - Shields the player from all sources of damage for 1 second. Player is suspended in the place for block full duration. Momentum is lost for the duration of, and after blocking.
  - Expends 1 charge resource

- Punch
  - Melee attack dealing damage to all nearby enemy players. Melee range slightly extends players sprite, to be decided based on gameplay. Range of Punch will be communicated through sprite graphic.
  - Expends 1 charge resource

#### Scalability

- Jump (Advanced)
  - Performing a jump while already moving in a given direction will carry some of the player's initial velocity. This can be the result of the player jumping with running left/right, or performing a jump after dashing.
- Block (Advanced)
  - Successfully blocking Punch from an enemy player will stun them for 1 second.
- Throw
  - Allows the player to throw other players or Power Orbs. A player or Power Orb that has been thrown will damage a player it comes in contact with. Thrown Power Orbs will perform an explosion on impact.
- Beam (Advanced Punch)
  - Beam is performed by holding down Punch. After holding Punch for 2 seconds an energy beam will be released in the players current aiming direction damaging players it contacts.

#### Damage

Receiving damage from an enemy player, Power Orb or arena hazard results in instant death.

#### Death

Player death will occur upon receiving damage from an enemy player. Once dead a player will respawn at a random spawn location after 3 seconds.

#### Power Orbs

Upon contact with a Power Orb the triggering player will receive a temporary boost.

- Movement speed boost
  - Player movement speed will be doubled.
  - 7 second duration.
- Shielding
  - Player will absorb the next 3 attacks.
  - 7 second duration.
- Resource regeneration increase
  - Regeneration delay halved.
  - Regeneration rate doubled.
  - 7 second duration.

#### Scalability

- Death Aura Orb
  - Kills players that stay in contact of the orb aura for 2 seconds.

## Key Algorithms

Key Algorithms which govern gameplay elements.

- Painters algorithm
  - Assists with sorting 2D sprites depth order.
- Tiling algorithm
  - Used to create arena layout based on input file.
- Jump
  - Jump algorithm to calculate jump height and how it is affected by gravity.
- Collision
  - Algorithm to detect collision between player characters, player attacks, Power Orbs, and arena platforms.
- AI movement
  - Algorithm to handle sporadic Power Orb movements.
- AI spawning
  - Spawning algorithm to handle random spawning intervals and locations for Power Orbs.

## Features

- Fast-paced competitive player vs player combat.
- Arena style combat to keep the action high.
- Impactful one hit combat.
- Reactive twitch combat.
- Local multiplayer.
- Simple controls.

## Control Scheme

Designed for controller use.

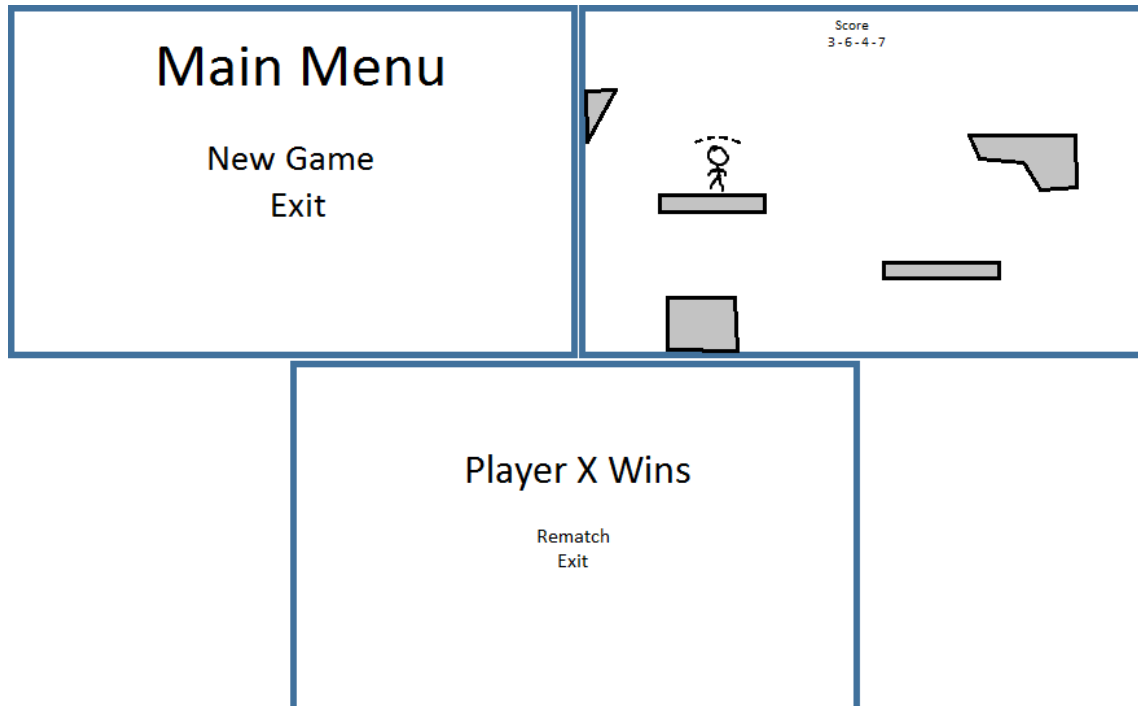
D-Pad	N/A
L Stick	Movement / Aim
R Stick	N/A
LT	N/A
LB	N/A
RT	Punch
RB	N/A
A	Jump
B	Block
X	Dash
Y	N/A





## Interface Design

A simplistic UI design has been adopted to ensure that players can focus on the action taking place on the screen. The Main Menu and Victory UI screens offer the ability to start a match, and exit. While a game is underway the UI will display the scoreboard in the top centre position of the screen. Above each player character's head there will also be a set of four lines. Each of these lines represents the current resource the respective player has available. Other UI elements such as health are unnecessary at this time.



## Cheat Features

Endless mode	Removes score limit. Game will continue until quit.
Spawn Power Orb	Manual trigger the spawn of a Power Orb.
Add player	Add a player character. Does not require a controller.
Infinite resource	Resource never runs out. Abilities can be used freely.
God mode	Players do not die when taking damage. Invulnerability.

## Asset List

### Arena

Brick foreground	Variant 1	Sprite	Tileable
Brick foreground	Variant 2	Sprite	Tileable
Brick foreground	Variant 3	Sprite	Tileable
Brick background	Variant 1	Sprite	Tileable
Brick background	Variant 2	Sprite	Tileable
Brick background	Variant 3	Sprite	Tileable

### AI

Power Orb	Movement variant	Sprite
Power Orb	Shielding variant	Sprite
Power Orb	Resource variant	Sprite
Power Orb movement particle		Particle

## Player

Player 1	Colour variation	Sprite sheet	Move, Jump, Punch, Dash, Block, Death
Player 2	Colour variation	Sprite sheet	Move, Jump, Punch, Dash, Block, Death
Player 3	Colour variation	Sprite sheet	Move, Jump, Punch, Dash, Block, Death
Player 4	Colour variation	Sprite sheet	Move, Jump, Punch, Dash, Block, Death
Dash effect		Sprite sheet	Motion blur body
Punch effect		Sprite sheet	Motion blur fist
Block effect		Sprite sheet	Glowing orb
Jump effect		Particle	Dust

## Audio

Dash	Sound effect
Punch	Sound effect
Block	Sound effect
Jump	Sound effect
Arena music	Combat track
Menu music	Menu music

## UI

Ability resource
Scoreboard
Main menu
In-game menu

## Scalability

Scalability options have been addressed for certain components. Should time permit, these additional features will be reviewed and implemented based on the value they will bring to the game.