Attack Action
Startup Attack Animation

- Cast Spell
- Draw Bow/Crossbow

- Draw Sword
- Backswing to attack
- Dash/Charge with Shoulder
- Teleport or magical assisted movement

Spawn

Projectiles Spawn
Fireball
Arrows
AOE – explosion
On-ground AOE – only affects those on ground
Short AOE – tagged to weapons

Persistent AOE- burning ground deals damage every 1s (may heal Caster)

Summon – AI controlled

Spawn

Melee – active Hitbox
Fireball
Arrows
AOE – explosion
On-ground AOE – only affects those on ground
Short AOE – tagged to weapons

Check

AOE Hit Detection
Fireball- Flying Sphere overlap check
Beam attack – recurring Line-trace check
Explosion – expanding/contracting overlap check
Grounded AOE– grounded cylinder check

Summon AI- damage and attack success may affect Caster

Check

Physical Hit Detection
Arrow- Narrow elongated sphere along Projectile path

Thrown Spinning Weapon- Spinning Weapon mesh overlap check

Check

Weapon Hit Detection
Weapon Mesh Overlap

Check

AutoSync Cone Skeletal Deformation
- Draw cone (~30 degrees wide)–hip to tip of weapon
- Check if target within 30degree cone
- Adjust skeleton 30 degrees and check weapon, if too close/far no damage applied

Flanking + Blocking Checks
- Check if target is facing you with Block
- Check if Target is flanked to deal "Flanked" effects

Headshot – for Sniping projectiles
- Check if projectile hits Headshot for "headshot" effects

Damage Equation

Damage Equation

Damage Equation

Combat Calculation Formula
1. **Hit Type Check -**
   1. Check eligibility/immunities
      - Blocking? Flanked?
      - Counterhit? Headshot?

2. **Attacker-side: Offensive Checks**
   1. Apply Weapon Enchants
   2. Appy Skill Damage modifiers
   3. Apply Stat/Passives and Magical Aura/Buff Modifiers
   4. Add Elemental damage (if any)
      - Adjust elemental Damage by magic modifiers

3. **Target-side: Defensive Checks**
   1. **Calculate Damage on Defense**
      1. Normal/Counterhit state?
      2. Check Armor/Defense/ Shields/block efficiency
      3. Check Resistances / Magical/Passives
      4. Apply Damage to Health, Apply Hitstun, Apply Debuffs
   2. **Redo Calculate Damage for each Element**

4. **Feedback Loops**
   1. Feedback to Player for Life/Mana

Type of Hit on Attack –
Many types of different hit and even misses have implications for various Player feedback

- **On Hit** -
  - Deals normal damage

- **On Critical/Counterhit**
  - Critical attacks deal extra damage and often additional Hitstun, and conditional effects (like steal life)

- **On Flanked Hit**
  - A type of special attacks will deal extra damage and often additional Hitstun, and conditional effects (like steal life)

- **On Blocked attack**
  - Feedback may give reduced conditional effects (eg. reduces weapon durability)

- **On Miss**
  - Counts attack as Misses and may trigger Conditional effects (spawn fireball if miss target)

- **Killing Blow**
  - If attack kills target, Feedback announces to Player for conditional effects (like +experience, Check +luck for loot drops adjustments, +1 mana per kill, kill count etc)

- **On Grapple**
  - Feedback may cause Unintteruptable states

- **On Parry**
  - Feedback allows followup Special Attacks/Actions or uninterruptable states

- **On Blockbreak**
  - Feedback may followup Special Attacks/Actions or uninterruptable states

On Hit

Melee – Feedback required
Immediate feedback after hit land

Physical Weapon attack (with Weapon mesh)
  - Standard Hit/Counterhit/Block/Miss- Feedback from Attacks that Hits affects buffs that generate/refund Mana/Life/Stamina/HP
Conditional Weapon attacks
- Buffs or Debuff deal additional effects on Critical/Flanked or Debuffed targets but not Normal Hits
  - Feedback Calculated on damage after Elemental Resistances
- Buffed/Enchanted Enchanted Weapon steals mana/life
  - Feedback Calculated on final damage dealt

On Hit

Projectile – Feedback
May exist independently from Player for 5+seconds

Arrows – simple arrow mesh
- Feedback for standard Hit/Counterhit/Block/Miss as mostly physical
Magic Fireballs – same as Arrows with special tracking and special meshes (eg. Beam)
- Feedback for standard Hit/Counterhit/Block/Miss
- Player actions may guide/redirect Magic Projectiles
- Spells may allow piercing/AOE or player to update/denonate magic Projectiles
AOE and DOT AOE= explosion
- Affects all enemies in area
- DOT AOE deals constant DOT damage (eg. 0.1-1second) and relevant feedback generated
On-ground AOE – only affects those on ground
- Affects all enemies in area but checks targets are "not In-Air" (eg. Not flying)
Short AOE – Magic Projectile Mesh tagged to weapons
- Follows weapon arc while Weapon mesh is "Active"

On Hit

Summon – Feedback
Totally independent from Player. May exist longer than player and give AOE feedback to other players/Allies.

Summon Guardian Angle – heals and attacks heal Player
Summon Image Clone– temporary clone of all player skill/items, all attacks deal damage as % of player including feedback.

Attacker – Feedback Loop
Immediate feedback after hit land

Attack Hits (with Weapon mesh)
- Moves Player forward X meters and Defender if moved back Y meters
- **Feedback**
  - If Defender is close to edge, he cannot move further back and player is in turn pushed Y meters back from Target

Attack is blocked
- Player and Target Defender is moved back
  - Player moves back small Z meters
  - Target Defender moves back small A meters
  - Important as this prevents enemies/players just stuck in melee attack loop where everyone just clumps up into mess

Target Defender – Feedback loop
Immediate feedback after hit blocked/hit

Attack Hits (with Weapon mesh)
- Moves Player forward X meters and Defender if moved back Y meters
- **Feedback**
  - If Defender is close to edge, he cannot move further back and player is in turn pushed Y meters back from Target

Attack is blocked
- Player and Target Defender is moved back
  - Player moves back small Z meters
  - Target Defender moves back small A meters
  - Important as this prevents enemies/players just stuck in melee attack loop where everyone just clumps up into mess

World Mesh Detection
- Detection of ledges, walls, bumps, uphill/downhill?.

Affects feedback loop on how much Attacker/Defender pushed back
- Minor

Ranged

Sniper
AOE
Caster
Healer

1. **Head Tracking – always active**
   • Feels a lot better
   • Shows what Ai is looking at

Melee

Unarmed attack
1h Weapon
Heavy Weapon
Long Polearm
Charger
- Leap slammer
Grappler
Bomb

1. **Idle – identifiable by type**
   • abc

Stealth

Backstabber villager
Sneaking Champion/Assassin
Ghost – slow invisible
Ghost (semi-visible)– slow flanker
Leap vampire
Flanker Sniper – hide

1. **Idle – identifiable by type**
   • abc

Champion

Combo
Heavy Polearm
Charger+Brawler – line (or slow turn)
 - Leap Slammer – (distance and leap pathing)

Archer – sniper
Archer- strafer
Caster – ranged AOE
Caster - Summoner
Caster- melee (nova, fire, short Aoe)

Flight – dragon line aoe
Flight – dragon/banshee strafe aoe
Flight – Caster
Flight – Archer
Flight – Dive to melee

Melee – blocker
Melee- Parry
Melee- pressure
Melee-

Melee Grandmaster
- Pressure, Rekkas, Frametraps
- Parry
- Reaction punishes
- Micro-Range sensitive attacks
- Short-term memory –
  - Repeat successful attacks
  - Stop unsuccessful attacks
  - Stop if punished
- Grapple and Blockbreak recognition
- Strategies
  - Anti-fireball
  - Anti-jump in
  - Anti-block

Aggro

1. **Spot Enemy = 1 aggro**
2. **IfHit Aggro = 10 aggro**
   • More allies = more aggression
3. **Broadcast Aggro on hit**
   • 5damage = 1aggro within range
4. **Player Heals**
   • 5damage = 1aggro within range

Aggro Adjustments
1. **Proximity adjustment**
   • Melee = x3 aggro for target
2. **Frenzied**
   • Wipes aggro for X seconds
3. **Group Tracker**
   • More allies = more aggression
   • Champion/Leader = more aggression
   • Healer/Shaman = more aggression

Pathing

https://www.youtube.com/watch?v=LxWq65CZBU8

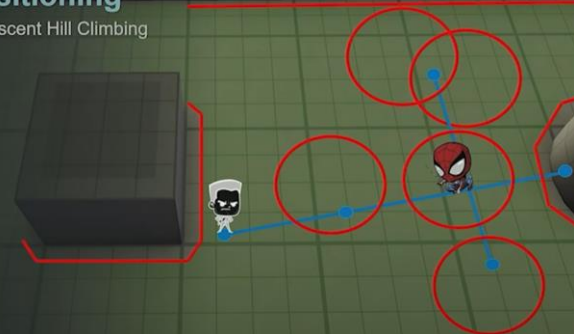**Idle/Patrol -** Unaware
Pursuit – Move to Target
   • Energy – sprint management if 0 energy
   • Anti-Cover – keep 1-2m from nearest cover/wall
      • Upkeep LoS(LineOfSight)= acquire and improve line of sight as secondary priority
Melee Range
   • Flanking Circle – max 6 within 5m

Bot Positioning
Gradient Descent Hill Climbing

DistanceCurrent + DistanceTarget + ClosePenalty + FarPenalty + CrossOverPenalty

Wakeup AI

1. **Getup –** if sitting/laying
   • Skip to Ambush if melee

2. **Head Tracking – always active**
   • Feels a lot better
   • Shows what Ai is looking at

3. **Unsheath**
   • Pull out sword
      • Enchant sword
   • Pull out Bow
      • load bow

4. **Communication Point**
   • Point to enemy
   • Call for reinforment
   • Scream alarm

Ranged Defense

   • Check if Projectile flying towards target (or AOE nearby)- %chance to react, Hero and Minions only
   • Dodge – lateral (Champion only)
   • Avoid AOE – (Champion only)
      • MoveToTarget MoveToTarget MoveToTarget

Non-Combat - Taunt/Fear/Movement

1. **Combat adjustments**
   • Lower Fear, Trigger Taunt
      • Hits target, kills a target
      • Enemy gets hit or dies
      • Pick up droped weapon
   • Increase Fear, Trigger Fear/Retreat
      • Gets hit
      • Ally within range gets killed (on death AOE announcing death to allies)

2. **Triggered Actions**
   • Fear
      • Surprize – look at killed ally, May taunt or fear/cower after
      • Cower while standing, Crouch + cover head
      • Beg for mercy "please", say "no no no"
      • Run to healer/shaman
      • Run behind Champion
   • Retreat
      • Look back and step back slightly as if scared
      • Hop back + taunt
   • Taunt
      • Wave weapon
      • Roar in aggression
      • Scream at you
      • Call for help (even if none)

Combat

AI Attacks –Requires tickets
- Hit / Miss / Block

Player Attacks
- Hit / Miss / Block

AI Ally Broadcasts

- **Ally Attacks or Hits Player-** reduce fear, +agression
- **Ally Hit/Dies –** trash fears, Champion may rage

Player faces AI – 15 degree cone infront of player
- Decreases target % to approach (if Within Melee range)
- Decreases target chance to attack Player
- May Trigger fear in trash/minion

Player Attacking – 180 degree cone infront of player
- Triggers block (with reaction speed)
- May trigger retreat/cower

Champion AI Memory

Memory of last 10 Player attacks and 10 AI attacks

If AI hit Player with attack X hit
- Increased priority to reuse X attack +2
    - Move other options down
    - Total 10 attack history

If Player Missed/Blocked with attack Y
- Increased reaction speed X attack -0.1s

If Player hit AI with attack X hit
- Reduce Aggression
- If Counterhit reduce priority of attack by -2
- Increased reaction speed X attack -0.1s

If AI Missed/Blocked with attack Y
- Reduce priority to reuse attack -1
    - Move other options down

Ticketing

Ticket Generation
- Availability by Range
    - Out of Range (>50m), max=1
    - Long Range (20-50m), max=3
    - Medium Range (5-20m), , max=5
    - Short Range (0-5m), , max=6

- Generation by Player state
    - Normal - 2/s
    - Flanked - 1/s
    - Hit - 1/s
    - Onscreen vs Offscreen
        - Offscreen has 50% increase cooldown

Ticket Stealing (hold attacks)
- Proximity (closer enemies)
- Special Attacks (steal from off-screen)
- Grapple – if grappled, all tickets/attacks to be held until further notice
    - Champions
- Champions -
    - If attack, steal 50% tickets from any nearby Trash
    - Specials on Active -steal 50% tickets from any nearby Trash

AI Attacker Options Combo

Range Attack – 5-50m
- Use lots of tickets
    - Low 30% to attack

Charging Attack - 5-20m
- Only useable from 5+m
    - Common attack for charging types

MeleeAttack - ~5m
- 1 ticket to attack
    - Distance to Player

Special Attacks – depends on enemy
- Use lots of tickets
    - Global cooldown for no more than 1 Special every 5s by default

No Ticket- Non-combat options
- Range Detection
    - Distance to Player

Range Attack
- Range Detection
    - Distance to Player

No Ticket actions

1. **Untriggered Actions**
   - Flank
   - Taunt
   - Stand in Idle - <1s, use minimally

2. **Triggered Actions**
   - Fear -Surprize – look at killed ally,
       - Cower while standing, Crouch + cover head, Beg for mercy "please", say "no no no"
       - Run to healer/shaman, Run behind Champion
       - Taunt after
   - Retreat
       - Look back and step back slightly as if scared
       - Hop back + taunt
   - Taunt- Wave weapon, Roar in aggression, Scream at you, Call for help (even if none)

Combat Variables

Range Detection
- Range Detection
  - Distance to Player
  - Distance to

- Options at Range
  - Out of Range-Long range
    - MediumMelee
    - CloseMelee

Ticketing
- Tickets to attack
  - 1 for melee, cooldown 0.5s+
  - 2 for range, cooldown 1s+

- Tickets release
  - 1 for melee, cooldown 0.5s+

- Ticket Stealing
  - Proximity (closer enemies 50%)
  - Backstab (alwo and cannot be stolen)
  - Special Attacks (steal from off-screen)
  - Champions

	Trash- Melee	Trash- Range	Minion- Melee	Minion- Range	Champion - Melee	Champion - Range
Max Range	10m	20m	20m	100m	100m	100m
Melee Range- walk within melee range	2m	2m	10m	5m	20m	10m
Attack Type	Unarmed/Weapon	Bow	Unarmed/Weapon	Bow	All	All
Hit-stun	Flinch	Flinch/Dot	HItstun	HItstun	All	Hitstun
Specials?	Heavy attack has Hitstun	Heavy attack has Hitstun	Crushing Hitstun	Spell	Spell	Spell
Tickets	0.5 to attack	1 to attack	1 to attack	1.5 to attack	Steals Tickets - Generates own tickets	Steals Tickets - Generates own tickets
Cooldown	1s	1.2s	0.7s	1s	0s	0s
If blocking	Keep attacking	50% Flank	75% Flank/approach	50% Flank	50/50 Blockbreak/ Flank/approach	50/50 Blockbreak/ Flank/approach
Non-combat Actions	75%	50%	25-50%	25-50%	10-50%	10-50%
Defense Reaction Speed	NA	NA	0.3-1s *Block/Dodge*	0.5-1s *Block/Dodge*	0.15-1s *Block/Dodge*	0.2-1s *Block/Dodge*
Movement Speed	Varies - Zerg always run	Low	Varies	Low	Varies	Varies
Aggression	varies	Low	Varies	Low	High	Varies

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- Reduce Aggression
- If Counterhit reduce priority of attack by -2
- Increased reaction speed X attack -0.1s

If AI Missed/Blocked with attack Y
- Reduce priority to reuse attack -1
  - Move other options down

Combat Management

Ranged Manager

- Cooldown Window.
- Attack Window.
  - Maximum simultaneous jobs.
  - Delay between jobs.
- Prioritize on-screen enemies.
- Off-screen = longer warning.

Combat Management

Cheap Hits

Certain actions cause enemies to not attack

- Web-throwing
- Web-striking
- Air-launching an enemy
- Dodging an attack
- Perfect-dodging an attack
- Using a finisher
- Jumping off an enemy
- Jumping
- Landing
- Being hit

Unless you repeatedly use them.

Unless it's a dodge.

Unless it's a boss.

Combat Management

Ranged Manager

- Cooldown Window.
- Attack Window.
  - Maximum simultaneous jobs.
  - Delay between jobs.
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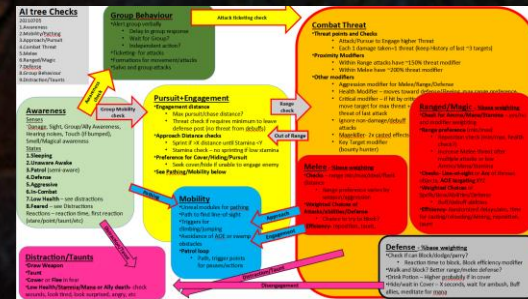- Off-screen = longer warning.

Combat Management

Cheap Hits

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- Perfect-dodging an attack
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- Being hit

Unless you repeatedly use them.
Unless it's a dodge.
Unless it's a boss.

Data Driven Behaviors
Example 2: Melee Combos

Data

- ComboConfig
- BotCombatEntry
- BotComboMoveContainer
- BotComboMoveBase

Behavior

- Behavior Tree
- BehaviorMelee
- BehaviorUseCombo
- Data Driven Sub-Behavior/State

Data Driven Behaviors
Ex. 1: Scripting AI Behavior

- BotCommand
- BotCommandQueue
- Behavior Tree
- BehaviorScripted
- Data Driven Sub-Behavior/State

Game Developers Conference

Tomb Raider GOAP Debugging – Details

```
[35.15] Attack (pri=91) - Target: laracroft:95
[39.28] Attack_Ranged (active) - Waiting (2.4s remaining)
 [36.99] Goto (completed) - Entering CoverPoint (17DE92C20)
  [35.98] UseObject (completed) - Finished after 1 use(s).   Reason:  reached requested usage limit of 1 (or Needs satisfied) after 1 uses
  [35.15] Goto (completed) - Finished: d=57.6, ok=0.0-64.1, goal=Pos
   [35.15] PlayInputAction (completed)
[34.38] Attack (pri=91) - Target: laracroft:95 - aborted @ 35.15
 [34.38] Attack_Ranged (aborted) - Became suppressed while starting shot
  [34.38] Goto (completed)
[31.93] Investigate (pri=94) - Event: ProjectileImpact (casual, d=304.9cm, t=laracroft:95, s=pr_arrow_recurve:3a) - aborted @ 33.48 (StateControl aborted the ActionPlan)
 (pending) Investigate (active)
  (pending) Goto (active)
   [31.93] PlayInputAction (active)
[21.45] Idle (pri=88) - canceled @ 31.93
 [21.45] Idle (active)
```

Rejected GOAP Goals/Actions for LastPlanningAttempt (@22.44 next=0.46):
Rest: Not Incapacitated
Despawn: No despawn request
Flee: Nothing to flee from
CallForHelp: No recent enemy sighting
UseTurret: No available turrets
Cover_Exit: CoverPoint Valid
UseObject_HighPriority: Nothing to use
UseWaypoints_HighPriority: No HP Waypoints
Attack => Attack_Melee: Too far away: d=5.96m, max=1.80
Attack => Attack_Seize: Disabled
Attack => Attack_Heroic: GOAP Action Disabled

Rejected GOAP Goals/Actions for PreviousPlan+2 (@21.45):
Despawn: No despawn request
UseTurret: No enemy to fire at
UseObject_HighPriority: Nothing to use
WithSquad: No squad
Investigate: Nothing to investigate
UseWaypoints: No requested WaypointSet
Follow: Nobody to follow
Patrol: No nearby patrol waypoints
Converse: Need comparison failed: Loneliness < -1.00 (value=8.52)
UseObject: Nothing to use

Behavior Trees

Confusing Parent Selection

GroupPolicy	OrderIsPriority
	Sequential
	ScoredCompetition

Behavior Trees

Decorators and Flags and Options, Oh my!

TickFlags	Looping
	TestChildDeciders
	CanInterruptChildren
Timers	Timeout
	Cooldown
	Global
	Death
TransitionMask	Cinematic
	Script

Behavior Trees

Marvel's Spider-Man Era

- Smaller and more straight-forward
  - Standard enemy went from 278 Nodes to 122 Nodes

Behaviors contain complexity

Shared structure.

- 1 standard enemy tree.
  - 4 derived enemy trees.
- 8 boss trees.

Single node for all melee combat.

Behavior Trees

Sunset Overdrive Era

Behavior Trees
Confusing Callbacks!

Bot State Aim

Decider	WantShootOverRailing
Redecide	RedecideShootOverRailing
OnInit	InitShootOverRailing
OnUpdate	UpdateShootOverRailing
OnDeinit	DeinitShootOverRailing

Data Driven Behaviors
Hierarchical Finite State Machines

- BehaviorScripted
- BehaviorUseCombo

Use LOS Blocker
Attack
  Attack Go To Blocker
  Attack At Blocker
Take Cover
  Roll In
  Step In
  Attack Reload
  Attack To Pop-out
Fight
  Perch
  Jump Up
  Attack Perch Shoot
  Jump Down
Ground
  Attack Pop-out
  Roll Out
  Step Out
  Shoot Over Railing
Ranged Combat
  Dodge
  Melee
  Get In Range
    Goto Firepoint
    Goto Target
Unblock
  Los Shuffle
  Backup
  Strafe
  Grenade Coll Test
  Grenade Throw
  Reload
  Taunt
  Stand

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Wall Splats

https://www.youtube.com/watch?v=LxWq65CZBU8
38:40min
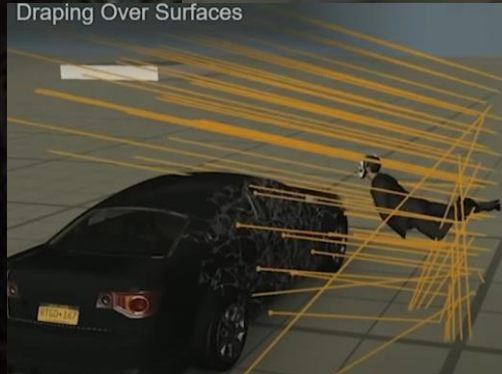**Rays to flatten against wall**
Wrap around if irregular target

Draping Over Surfaces

AI Positioning

Initial Cross positioning for Surrounding AI
- Inner circle is distance Mob wants to be at
- Cannot be too close to another enemy (Champions take up more space)
- Use Cross to find a position they want to go
- Then go to closes position

Repositioning
- Don't move if recently moved or if target positioning is really close
- Move if havne't moved for a while

Bot Positioning

Position Ranking

$$\text{DistanceCurrent} + \text{DistanceTarget} + \text{ClosePenalty} + \text{FarPenalty} + \text{CrossOverPenalty}$$
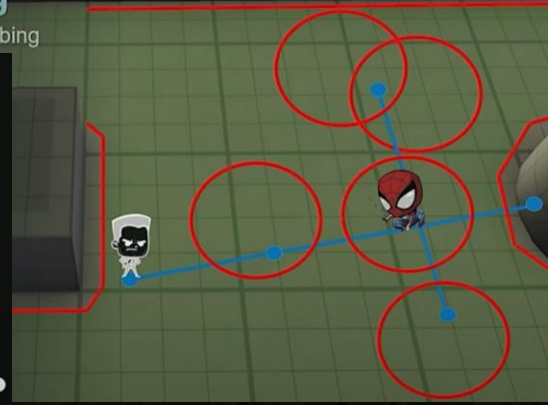
Bot Positioning

Repositioning Hysteresis

Already Close? Don't move.

$\text{DistCurrToAttack} - \text{DistWaitToAttack} = \text{DistChanged}$

$\text{BackHyst} < \text{DistChanged} < \text{ForwardHyst}$

$\text{BackHyst} = \text{Lerp}(\text{timeWaiting/maxTime}, \text{BackMin}, \text{BackMax})$

$\text{ForwardHyst} = \text{Lerp}(\text{timeWaiting/maxTime}, \text{ForwardMin}, \text{ForwardMax})$

Bot Positioning

In Motion Hysteresis

$\text{DistToCurrWait} > \text{Threshold}$
$\text{DistToNewWait} > \text{Threshold}$
$\text{DistCurrWaitToNewWait} > \text{Threshhold}$

Update Destination

Loot – Drop-table Calculations
20201204

Kill Monster

1. a) **Check *Monster Level*:** level 5
   - Level range 0.1 – level 999
2. b) **Check Monster Name/AI:** Zombie3mage
   - Text for monster name, AI type, variation?
3. c) **Check Treasure Type:** - treasure type 12
   - Treasure type 1-10,000?

Loot Table Flow

	Step	Check (simplified to 2 digit)	Result
1	Kill Monster	Check monster Level (Summary sheet)	50 monster Level
2		check	Check monster Name (LootTable sheet)	Zombie3
3		check	Check Treasure Type (LootTable sheet)	Treasure type 12
4	Roll	Roll chance to drop anything Drop% (LootTable	40%
5	Roll	RandomBetween Min/Max drop% (LootTable sh	0-1drops = 1 drop
6		check	Check Treasure Type probabilities to create Iter	Weight slot probability table
7	Roll	Random1000 Weighted table for Item Type Drop	Drop Weapon
8	Roll	Weighted Table for Item Type (Items Sheet)	Drop Mainhand Weapon
9	Roll	Luck adjusted random Quality of item with (Summa	Rare item with 3 enchants
10	Roll	Luck adjusted random Level of Enchant (Summary c	Level 12 enchant
11		check	Check total number of weighted enchantments	914 rolls for enchantment
12	Roll	Random1000 to get enchantment (Summary K55	+Damage enchant
13		check	Enchantment level against Enchantment Min/M	+70%
		- may need to change this to adjust by Leveling Damage curve later	
6	Roll	MainHand Level	Roll Player LVL+10% or -50%	Level+1
7	Roll	MainHand Enchantments3	# of Enchantments	2
8	Roll	MainHand Enchantment1	Roll type + level enchantment	+dmg level10
9	Roll	MainHand Enchantment2	If max level then =level1 encha	+light aura
10	Roll	MainHand Enchantment3	If max level then =level1 encha	+light aura
11	Roll	MainHand Enchantment4	If max level then =level1 encha	+light aura
12	Roll	MainHand Enchantment5	If max level then =level1 encha	+light aura
13	Roll	MainHand Enchantment6	If max level then =level1 encha	+light aura
14	Roll	MainHand Enchantment8	If max level then =level1 encha	+light aura

Player Random Rolls

Drop1 | Drop2 | Drop3 | Drop4

4. a) **Roll chance to drop multiple items** – rolled 1/123,456
   - Check against chance to drop anything (skip for boss/champion/elites)
   - If drop multiply by chance to drop multiple items
   - Multiple item drops require multiple rolls for below

Reroll for each Item

5. b) **Roll chance to drop Treasure Table Type:** - roll random number 987, drop Weapon
   - Roll options is weighted probability of:
     - weapon, armor, jewelery, food, crafting, gold/scrap

6. c) **Roll chance for Slot of item within type :** - roll random number, drop mainhand sword
   - Roll options is summary of slots for:
     - weapon, armor, jewelery, food, crafting, gold/scrap

Name	Description	Min level	Max Level	% damage	%hp @lvl	Treasure t	Drop %	Min Drop	Max Drop	Weapon	Armor	Jewelry	Food	Potion	Crafting	Gold/scrap	Banned itm Added in
Critter1	barrel, pot	0.1	0.3	0%	1%		5%	0		1%	1%	0.10%	2%	2%		2%	92% large obje unique
Critter2	rat/bird/chicken	0.3	1	0%	1%		5%	0		2%	1%	0.5%	3%	2%		3%	89%
Critter3	dog	0.5	3	10%	5%		5%	0		2%	2%	0%	4%	4%		4%	85%
Critter4	1arm skeleton/zombie	0.7	1	40%	10%		20%	0		5%	5%	0.50%	4%	4%		4%	79%
Skeleton1	unarmed	1	20	60%	15%		25%	0		5%	5%		5%	5%		5%	73%

Luck Adjusted Rolls – Adjust below by luck to increase quality of drop

7. a) **Luck adjusted roll for Quality of item:** 1/1,000,000
   - Check drop table and determines if item is **magic/rare/unique**
   - Determines item base stats (several rolls required for each item stat)
     - Base damage/armor/block, base durability/remaining durability

8. b) **Luck adjusted roll for Number of Enchantments on item:** 1/100,000 for enchant
   - Number based on monster level, treasure type, etc…

Reroll for each Enchantment

9. c) **Luck adjusted roll for Type of each Enchantments:** 1/1,000 per
   - Check Enchantment type for enchantments to roll
   - Certain monsters in certain areas may have higher probabilities
     - Eg. +300% chance to drop Fire enchanted weapon

10. d) **Luck adjusted roll for Quality of each Enchantments:** 1/1,000 per
   - Number based on monster level, treasure type, etc…

Item name	Lore Description	Slot	Item Type	Min level	Attack	Min Vitality	Min Strengt	Min Dexteri	Min Affinity	Durability	Block	Weight (k	Damage%	Armor%	Moveset	%Price of Slot
Broken Sword	Crushed sword of	Offhand	1H Sword	0	Slash					5		2	50%		Longsword/Katana/Dual	25%
Knife		Offhand	1H Sword	0	Slash					10		0.5	80%		Longsword/Katana/Dual	50%
Shortsword		Offhand	1H Sword	3	Slash			2		15		1.5	90%		Longsword/Katana/Dual	70%
Longsword	Standard longsw	Main Hand	1-2H Swo	1	Slash			5		20		2	100%		Longsword/Katana	100%

Total Possible Enchantment drops		3926	4092	6437	3382	4037	1404	3640	2954	6234	6131	4477				
	random	byte	byte	byte	byte	byte	byte	byte	byte	byte	byte	Float	Float			
		336	3938	2533	3986	4032	4030	4030	4030	4030	2035	3857				
	Description	Main Hand	Offhand	Head	Cloak/hoc Body	Gloves	Belt	Legs	Shield	Amulet	Ring	LVL Reg	Lvl Max	Min stat	Max stat	Probably adjustment
1 byte	+Damage	1=Mainstat	1=Mainsta	1=Uncomm	4=Rare				0=NA	1=Mainst	1=Mainst			10%	100%	25.47%
2 byte	+Armor	0=NA	0=0.5	1=Mainst	1=Mainst	1=Mainst	1=Mainst	1=Mainst		0=NA	0=NA	1=Rare	4=Rare	4=Rare		25.03%
3 byte	+Affinity	2=commo	2=commo	2=commo	2=commo	2=commo	2=commo	2=commo	1=Mainst	1=Mainst	1=Mainst		60			25.02%
4 byte	+Strength	2=commo	2=commo	2=commo	2=commo	2=commo	2=commo	2=commo	0=NA	2=commo	2=commo		60			25.02%
5 byte	+Dexterity	2=commo	2=commo	2=commo	2=commo	2=commo	2=commo	2=commo	0=NA	1=Mainst	1=Mainst		60			

Combat - Damage Equation Flowchart 20200513

Base Stats (at level 10)
Base Hit Points = 100
Base Time-To-Kill = 20s
Base DPS = HP/20 = 5

Base Stats – not implemented yet
- Stat multiplier will be implemented during leveling with a semi-linear progression chart
Strength
Arcane Affinity
Dexterity
Stamina
Experience points – non linear scale. Requires chart. ~130% per level

Player details to Attack Initiated
Player Reference = "Hero1"
Player Faction = "Friendly1"
Player Type = "Human"
Base Weapon Damage Multiplier = +50% Base
- New DPS = **1.5** x 5 = 7.5
Name of Attack Skill = "Heavy sword attack1"
Damage type = Slashing
Skill Damage Multiplier = +10% damage
- New DPS = 7.5 **+10%modifier**
Skill Additional Modifiers =
                IF Counterhit = +50%dps,
                + Crushstun for 1 second

Passives, Weapon, and Item Modifiers:
Passives = Mana on hit +1 (Counterhit +2, death +3), Energy on hit +1, Lifesteal 5% damage dealt
Ring of +1 max damage = +1 max damage
- New DPS = 7.5 +10%modifier **+1, Checks=1**
Sword of +30% undead damage =
                IF target Undead= +1 damage

Player Buff Modifiers:
Flaming Divine Aura = +30% damage as fire, -10% defense to enemies within 10m, can only enhance damage once every 1second
- New DPS = (7.5 +10%modifier +1) + **(7.5+30% fire damage), Checks=2**

Player DeBuff Modifiers:
Cursed flame fireball (level1) = -10% base damage, -10% runspeed, -1% mana per second, lasts 5seconds (4seconds remaining)
- New DPS = (7.5 **+10%-30%modifier** +1) + (7.5+30% fire damage), Checks=2

Enemy Checks
Enemy Reference = "Skeleton1"
Enemy Faction = "Evil1"
Enemy type = "Undead"
 - Check if Undead= Yes = +30% damage
- New DPS = (7.5 +10%-30%+**30%modifier** +1) + (7.5+30% fire damage), Checks=1

Base Hit Points = 30% of Base HP = **30hp**
Enemy hit state = "Startup of Base Skeleton attack Level 7"
Counterhit Status = Yes Counterhit
 - Check if Counterhit= Yes = +50% damage
- New DPS = (7.5 +10%-30%+30%+**50%modifier** +1) + (7.5+30% fire damage), Checks=0
Resistances = -10% resistance to Fire
- New DPS = (7.5 +10%-30%+30%+50%modifier +1) + (7.5+30%+**10% fire damage**), Checks=0

Relevant Armor and Item Modifiers:
Armor type = "Broken Skeletal mail Level 3"
Defense of armor = -30% defense
 - new DPS= (7.5 +10%-30%+30%+50%modifier +1)-30% + (7.5+30%+10% fire damage), Checks=0
Other Modifiers = +10% hp of skeleton, IF Piercing damage -30% damage taken
 - Enemy HP = 30+**10% = 33**

Enemy Buff Modifiers:
Necromancer Champion Aura = +10% base damage, +10% movement speed, +10% hp
 - Enemy HP = 30+(10%+**10%) = 36**

Enemy DeBuff Modifiers:
Flaming Divine Aura = -10% defense
Final Damage= (7.5 +10%-30%+30%+50%modifier +1)-30%+**10% +** (7.5+30%+10% fire damage), Checks=0

Final Damage = (7.5*1.6+1)*0.7 + 7.5*1.4 = **9.1 + 10.5 = 19.6 damage dealt**

Skeleton HP = 36 hp – 19.6 damage = **16.4hp remaining**

Recursive Functions to Player
Check if Attack landed = YES
- Player Passives = +1energy

Check if Attack was Counterthit = Yes
- Player Passives = +2mana

Check if Target died = No

Check total damage dealt = 19.6
- Player Passives = 19.6*5% = +~1 HP

Check "Flaming Divine Aura"= timestamp no "Flaming Divine Aura" damage buffs for 1second after this attack landed

Gameplay and Item – all systems
Categories and grouping
20201015

Charms
Held in inventory
1. **Reactive enchantments**
2. **Protect from death**
3. **Luck and drop charms**

Gems/Runes/Jewels
Put into socketable items
1. **Gems-** 7 types 10+ quality
2. **Runes-** 30+ types, no quality
3. **Jewels-** can hold any unique

Socket

Enchanted Items
Equipped items in slots
1. **Main Weapon**
2. **Off hand** (weapon/shield)
3. **Helm**
4. **Cloak**
5. **Body Armor**
6. **Hands**
7. **Belt**
8. **Legs**
9. **Amulet**
10. **Ring1**
11. **Ring2**

Destroy Item

New/Upgrade

Crafting
Modify or creating new items
1. **Disenchanting**
2. **Smithing Recipies**
3. **Transmutation-** combining gems, etc
4. **Enchanting items**
5. **Runewords**

Player Stats
Base stats
1. **Vitality =** Health
2. **Strength =** Melee damage
3. **Dexterity =** Ranged Damage
4. **Stamina =** endurance

Enchantment Records
Summary of all Enchantment and modifiers from various sources

Offensive Enchantment Records
Summary of all offense buffs from any source
• Eg. +Strength damage bonus, Procs
• Buffs- Skill-Tree mastery bonus
• Debuffs – such as Weaken all attacks

Main Hand + Projectile Records
Summary of Main Attack enchantments
1. **Base Weapon Damage**
2. Weapon only bonuses (eg. +fire sword),

Off Hand Records
Summary of Off-hand Attack enchantments
1. **Base Weapon Damage**
2. Weapon only bonuses (eg. +fire sword)

Defensive Enchantment Records
Used for Defense calculations
• Defensive Stat bonuses for HP/dodge/resistance
• Armor/Defense and Resistance calculations
• **Buffs-** Flat +armor, Procs and other bonuses
• **Debuffs-** Magical Curses, unaware/dazed, elemental (eg. frozen/burning) debuff, Diseased
• On Death or Low health protection/triggers
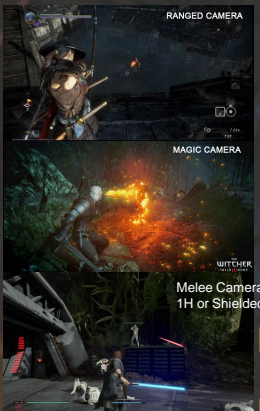
Shield Based Defense Records
Shield specific Buffs and Debuffs
• Shield type, Blocking efficiency
• Blocking skills, Blocking Buffs and Debuffs

Generic Records
General Buffs and Debuffs
• Stat regeneration of mana/stamina/hp
• +/- Walk/Run/Dash/Sprint speed, jump encumbrance
• Light and vision

Stances - Swap quickly on the fly in combat.
Modifies available skills

1. **Unarmed Stance -**
Magic

2. **Ranged Stance –**
Bow

3. **Melee Stance –**
Weapon only

4. **Melee Stance –**
Shield+Weapon

RANGED CAMERA

MAGIC CAMERA

Melee Camera
1H or Shielded

Martial Skill tree
Master new skills by Weapon type.
1. **1 Hand Weapons -**
   1. Dagger
   2. Longsword
   3. Axe / Mace
   4. Dual Weapon
2. **Shield Skills -**
   1. Kite Shield
   2. Tower Shield
3. **2hand Weapons-**
   1. Greatsword
   2. **Poleaxe**
4. **Ranged Weapons-**
   1. Bows
   2. Thrown Weapon
5. **Magic Implements-**
   1. Wands
   2. Staffs
   3. Crystal Orbs

EX Power Attacks
Uses Extra Stamina/Mana
1. **Charging attacks**
2. **Wide cleave attacks**
3. **Fast multi-strikes**
4. **Armored Attacks**
5. **Powerful Grapples**

Magic Skill-Tree
Master spells by school.
1. **Divine School**
   1. **Quickspells**
   2. **EX Powered Spells**
   3. **Greatspells**
2. **Void School-**
   1. **Quickspells**
   2. **EX Powered Spells**
   3. **Greatspells**
3. **Dragonflame School-**
   1. **Quickspells**
   2. **EX Powered Spells**
   3. **Greatspells**
4. **Wild Storm School-**
   1. **Quickspells**
   2. **EX Powered Spells**
   3. **Greatspells**

Offensive Enchantments

Applies to all attacks.
- Buffs are from Amulets/Rings or weapons that affect character as a whole

1. **Stat**
   • +Strength (+Melee damage)
   • +Affinity (+Magic damage)
   • +Dexterity (+Ranged damage)

2. **Magic and Mastery**
   • **%proc effect** (Curse, fireball, lightning, aoe, poison)
        • AOE, DOT, fireball, small burst, etc…
   • **+Elemental Magic dmg** (+10% fire/ice/lightning/poison etc)

3. **Bonuses**
   • +X Life/Mana on Hit
   • +X Life/Mana on Kill
   • +X Life/Mana on Critical
   • X% Piercing/Seeking effect on projectiles
   • Attacks deflect/Reflect minor projectiles (Major projectiles/Magic spells)
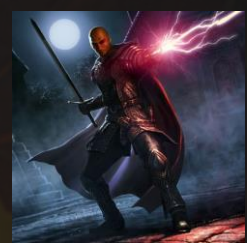
Main Hand / Projectiles - **(**weapon or bow or wand)

Below Enchantments affect this weapons attack only and not Offhand attacks.
- May affect Magic attacks if there is a physical element in the Magic attack.

1. **Base Attack Damage-** eg. 1-20 damage
2. **Enhanced Damage-** +5-200% affects Base Weapon damage only and not other weapons

3. **Proc effect**
   • **% proc Elemental Spell on attack –**
        • 50-100% Fireball – shoot level 1 fireball on attack
        • Others= cold bold, ghost arrow, ghost arrow
   • **% proc Elemental Spell on hit –**
        • 5-20% proc Cold Nova level1 on hit
        • Others = Immolating fire, Poison Cloud, Chain lightning
   • **% proc Curse type 1 level 1 (many curses can be procced)**

4. **Weapon only Bonus –** applies only to this weapon
   • **+X Elemental dmg** (Fire, Ice, Void, Electrical, Poison)
   • +X% **Mana/Life on hit** – based on damage
   • Flat +X **Mana/Life on hit**
   • **Manasteal/Lifesteal –** Gain X% of damage back as Mana or Life
   • **+30% damage to undead** (Blessed/Silvered/Holy weapon)
   • **Deadly Strike** +50% Critical Damage

Off Hand – **(**weapon or shield)

Below Enchantments affect this weapons attack only and not Main Hand attacks.
- May affect Magic attacks if there is a physical element in the Magic attack.

1. **Base Attack Damage-** eg. 1-20 damage
2. **Enhanced Damage-** +5-200% affects Base Weapon damage only and not other weapons
3. **+Elemental magic (Fire, Ice, Void, Electrical, Poison)**
4. **%proc effect (Curse, fireball, lightning, aoe, poison)**

5. **Shield only -** % Proc on block bonuses
   • **% proc Elemental spell–** 5-100% of blocked attacks trigger elemental Nova attack (cold, lightning, poison, fire,)
   • **% proc Reflect Magic** – 10-100% of magic projectiles reflected on
   • **Magic Absorption** – absorb 1-5% of blocked magic damage as health
   • **Kinetic Absorption** - absorb 1-5% of blocked physical damage as health
   • **Magic Absorption** – absorb 1-5% of blocked magic damage as health
   • **Kinetic Absorption** - absorb 1-5% of blocked physical damage as health

Defensive Buffs

1. Stat – enhances many parts of player
- +Vitality (+2-3 hp per Vitality)
- +Dexterity (+% block)

2. Flat Defense and Resistances
- **+X Base Armor per slot**
    - Enhanced Armor by slot (on each piece and affects each piece only)
- **+% Evasion-** reduce AOE damage
- **+% Toughness –** reduce % critical damage
- **Prismatic Resistance** – resist all Magic %
- **Resist Magic** – resist all Magic -X damage taken
- **Kinetic resistance** – resist all physical damage X%
- **Resist Physical** – resist all physical damage X dmg

1. Flat Bonus
- +X **Base Armor total** (adds to total armor)
- +X **Damage reduction** (per hit)
- +X **Shield Block damage amount**,
- +X% **Block Chance**,
- +X% **Block Effectiveness** (increase block amount)
- **Impenetrable** – reduce critical damage -X%

2. % Proc Bonus
- % proc **if hit by enemy –** cast spell (cold nova, poison cloud, chain lightning, etc)
    - Cast self-buff spell (Blessed Aim spell)
- % proc **if Block an attack** – cast spell
    - Reflect 50% Damage,
    - Generate X hp Temporary Shield
- 50-100% proc **if Parry an attack** - cast spell (cold nova, poison cloud, chain lightning, etc)

General Enchantment - Buffs

1. Stat – enhances many parts of player
- +Strength (+armor holding weight)
- +Vitality (+Stamina, +grey health regen)
- +Affinity (+mana and mana regen)
    - +X% mana regeneration/s, +X% mana refunded 5s after spell cast
- +Dexterity (+silent walk speed)

2. Buff Effects
- Light aura, Darkvision, Sense Evil, Sense Magic
- +Runspeed, +armor holding weight
- +Magic Mastery by school (+1-3 levels in Dragon/Void/Paladin magic school)
- Reduce Mana cost by School (Dragon/Void) or Element (fire/ice)

3. Bonus
- +10% experience on drop
- +50% Gold Chance, Magic Chance,
- **Thorn Armor-** reflects X% physical damage taken in melee range

4. Proc Bonues
- **% proc Elemental Armor –** 1-20% of attacks trigger elemental Nova attack (cold, lightning, poison, fire,)
- **% proc Reflect Magic** – 1-5% of magic projectiles reflected on

General Enchantment - DeBuffs

1. Cursed (void magic)
- **Elemental Debuff** +30% dmg from Fire/Void/Cold
- **Slow Debuff** – -10-30% runspeed for Xseconds
- **Amplify Damage** – Take extra +10-50% from physical attacks
- **Amplify Magic** - Take extra +10-50% damage from magic attacks
- **Weakness-** reduce physical attack damage 10-30%

2. Player states -
- **Unaware/Sleeping/Hit-from-behind -** +10-50% damage taken
- **Dazed** – reduce physical and magic damage 10-30%, increase damage taken 10-30%, reduce runspeed 10-30%
    - multiple levels of Daze 1-3
- **Stunned –** cannot move, use items, attack or perform any actions other than look around with camera for X seconds

3. Elemental Debuff – multiple levels of debuff 1-5
- **Cold Debuff –** Runspeed -5-30%. Takes extra 10-30% damage from Cold damage
- **Frozen debuff-** Unable to move, Take X damage if dash/sprint within Xseconds (until debuff
- **Burning Debuff-** Takes extra 10-50% damage from Fire damage
- **Poisoned Debuff** - Takes extra 10-50% damage from Nature damage, may be slowed

Gameplay Movement Controls

Consistent controls

- **WASD =** Movement relative to camera
- **Dash =** in WASD direction
- **Roll** = in WASD Direction
- **Jump** = in WASD direction

Animations

8way walk
8way dash
4 way Roll
1 way sprint

Sprint

Roll

Dash
Keyboard - 4 way
Console - 8 way

Dash
Console - 8 way

Dash
Console - 8 way

Walk
Keyboard - 8 way
Console - analog

Walk
Keyboard - 8 way
Console - analog

Walk
Keyboard - 8 way
Console - analog

Roll

Dash
Keyboard - 4 way
Console - 8 way

Walk
Keyboard - 8 way
Console - analog

Walk
Keyboard - 8 way
Console - analog

Dash
Keyboard - 4 way
Console - 8 way

Roll

Walk
Keyboard - 8 way
Console - analog

Walk
Keyboard - 8 way
Console - analog

Walk
Keyboard - 8 way
Console - analog

Dash
Console - 8 way

Dash
Keyboard - 4 way
Console - 8 way

Dash
Console - 8 way

Roll

Vertical Jump
Always Available

Jump Backward
Always Available

Jump Forward
Always Available

Jump Left
Always Available
8 way

Jump Right
Always Available
8 way
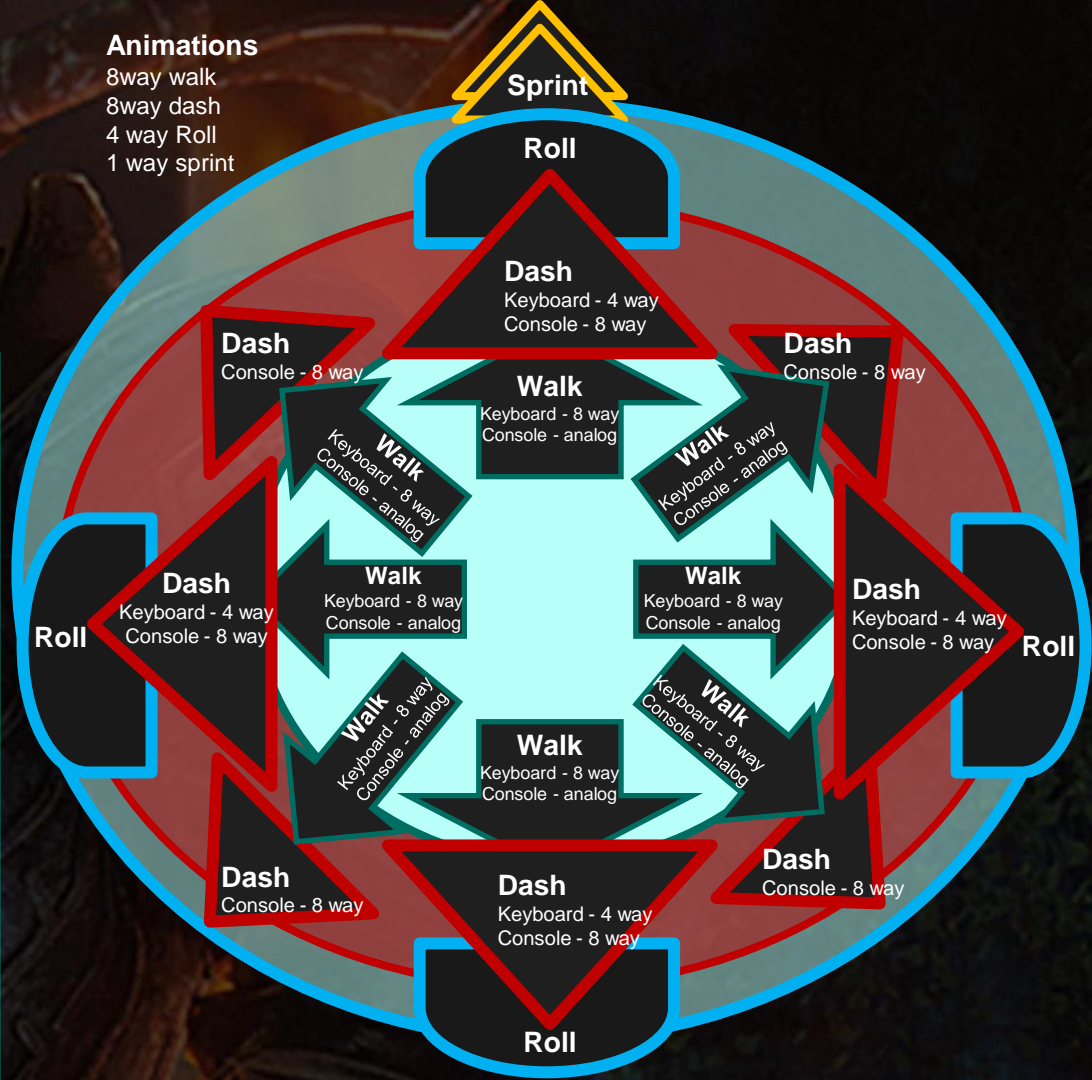
Game Mechanics

Stance design and Stance Swapping
>> Swapping Stance for drawing weapon mechanics
>> Timings for Stance swaps

Magic Schools – and progressive spells types (Quickmagic)

Grappling mechanics

Combat Stance Switching
20200514

Buttons

Press **Sheath/Draw Button** Once → No delay to draw shield
0.1s to draw weapon

Press **Sheath/Draw Button** Once ←

← Press + Hold **Sheath/Draw Button**

Press **Sheath/Draw Button** Once (to return to previous stance) → No delay to draw shield
0.1s to draw weapon

Pure Magic Stance –
2 empty hands or Mage items

Swap out of Weapon:
- **Adds 0.1s** to magic startup speed

Greater Magic
Powerful slow spells which uses both hands and 1-5 seconds to cast
- AOE storm
- Powerful Beam attacks
- Big heals
- Summon undead/elementals/golems

One Weapon Stance-
Longsword, Poleaxe, Greatsword, Bow/Crossbow, Spear, etc

QuickMagic
Quick magic that only uses 1 hand (empty offhand to cast)
- Throw fireball, arcane missiles, lightning lance
- Cast Enchant / Aura to buff self
- Grapple target with Vampiric grasp

Swap out of Shield + Weapon:
- **Adds 0.5s** to Quickmagic startup speed

Shield+Weapon Stance-
Shield+sword/axe/mace, Shield+polearm, etc…

No Magic in this stance
- Needs to swap to other stance to cast magic
- Pressing magic button automatically swaps out shield to cast spell
(If no other input will automatically swap back to shield after)

Pros- best block defense

Swap out of Dual Sword:
- **Adds 0.1s** to Quickmagic startup speed

Dual Sword Stance-
Dual axe, dual mace, etc

No Magic in this stance
- Needs to swap to other stance to cast magic
- Pressing magic button automatically swaps out shield to cast spell
(If no other input will automatically swap back to shield after)

Pros – dual weapon damage is very high in melee, Can throw weapon as short ranged attack

Applications – 4 stance options
20200825

Keyboard Controls - MMB Scrollwheel = Stance Switch
Pad Controls - Press SQUARE+Left Dpad to choose stance

2.
1. **4.**
3.

Applications of Stance Switching
1. Forces player to commit to Magic or Melee or Defense
    1. Staying in 1 stance is typical of early levels
    2. Later levels reward multiple skills and swapping stances to cover each weakness
2. Combo into Stance Switching **Rewards Skill**
    1. LMB+Stance Switch = different faster attack that allows combo not possible without the stance switch
    2. Stance switch normally takes 0.5s if not comboed
    Combo into Stance Switch reduces delay = 0.1s delay

1.

Ranged Stance

Bow/Crossbow, Throwable weapon (Javelins/knives/Axe/sword)

- **Ranged Stance –** allows zoom to aim and attacks can headshot target
- Required for sniping and long-range projectiles or magic/spells

Press MMB+RMB+"R"

2.

Magic Stance

Empty hands or Focus item (orb, wand, staff, book, skull, etc)

- **Magic Stance –** increases speed of magic casting. Required for Greater spells.
- **Focus =** item that reduces cost of spells, may increase power when held

Press MMB+"R"

3.

One Weapon Stance

1 or 2 handed weapons (longsword, dagger, axe, poleaxe, greatsword, staff, etc)

- **One Weapon Stance –** Allows mix of Melee and magic
- Can only cast Quickmagic spells
- Can hold Focus in left hand if 1 handed weapon
- If 2handed weapon like Poleaxe, holding Focus in left hand forces 2 Weapon stance

Press MMB+LMB

4.

Shield+Weapon Stance

Shield + Weapon or 2 weapons

- **Shield+Weapon –** improves block ability and armor, very slow attacks with heavy 2handed weapons
- **2 Weapon Stance –** Allows quick multi-attacks for 1 handed weapons
- Cannot cast Quickmagic or drink potion without unequipping Shield
    - Automatically unequips shield for QuickMagic and drink potion/item
    - Automatically re-equips shield after

Press MMB+LMB+RMB

Throw Weapon
Throws weapon/Javelin/boomerang that may return. Without weapon is Pure Magic Stance

Iajutsu – Quick draw of weapon
Skill that automatically "Draws Weapon

Throw Shield
Skill that automatically "sheaths Shield" Shield may return/boomerang to equip.

Empty Jump
Draw+Jump looks the same without slash

Flying Slash
180-360EX wide slash
Negative on block

Jumping Iaijutsu attack
- Committing to an Iaijutsu Jump+Attack enhances jump to stay low
- Will draw sword and attack in a quick wide cleave when near floor/wall or enemy
- Can also jump over and do 360 attack into group

Dash Upward Slash
Only ~90 coverage
Faster
- can Parry

Dash Cleave
180 coverage
Longer, slower, more negative

Charging Iaijutsu attack
- When sword is sheathed, runspeed improved
- Sprint is extra fast and draws very quick
- No armor but 180 cleave even on block is not punishable
- Commit to attack type before startup

Sheath Weapon to enable Iaijutsu specials-
- Can automatically sheath weapon after attack
- When weapon sheathed block is reduced

Iaijutsu Multislash
Quick 3-5 slash
- Deals a lot of damage in combo

Drawing Sheathed Kanata - Iaijutsu
- When drawing weapon from sheathed position attack is improved, faster, longer ranged, hits harder and much better framedata
- Can combo into more attacks and uses less energy
- **Parries on Counterhit for extra Stun**

Iaijutsu Parry
Powerful parry
- Parries all damage
- Huge stun on parry

Orb can be thrown by all players for additional mobility and key game mechanic

If ThrowOrb hits object before max distance
- it will stick unless recalled
  -- max range improves by level/energy, pull speed increases with skill/level/energy
- Certain targets are "waypoints" that can Pull Player further than normal and allow Hanging to "waypoint" which may be onwall or bottom of ceiling which allows for retargeting to next location

Press **Orb+Jump to Jump to Orb –** Release to glide
Press **Orb to Recall Orb –** may return slowly or fly back quickly to deal damage, drag target to you, explode with magic

If DartThrow hits small object
- it can grab object and on recall will bring object
- Use to pickup objects and activate levers within range, can attack chests

If DartThrow is blocked – will bounce back and cannot drag enemy

Applications of Stance Switching
1. Forces player to commit to Magic or Melee or Defense
   1. Staying in stance is typical of early levels
   2. Later levels reward multiple skills and swapping stances to cover each weakness
2. Combo into Stance Switching **Rewards Skill**
   1. LMB+Stance Switch = different faster attack that allows combo not possible without the stance switch
   2. Stance switch normally takes 0.5s if not comboed
      Combo into Stance Switch reduces delay = 0.1s delay

Pure Magic Stance

One Weapon Stance

Shield+Weapon Stance

Draw Weapon — 0.3s

Combo into Draw Weapon — 0.1s

0.1s — Combo into Sheath Weapon

0.2s — Sheath Weapon

Draw Shield — 0.3s

Combo into Draw Shield — 0.1s

0.2s — Combo into Sheath Shield

0.5s — Sheath Shield

Throw Weapon
Skill that automatically "sheaths weapon"

Throw Shield
Skill that automatically "sheaths Shield"

Iajutsu – Quick draw of weapon
Skill that automatically "Draws Weapon"

Choose your Schools of Magic in Ankhoron
School determines your type of magic. All machines split into 2 types (Quickmagic or Greatspells)
1. **Dragon – ChaosFlame**
2. **Elemental – Warped**
3. **BlackFlame - Undeath**
4. Sacred/Holy/Light (WIP)
5. Blood/Earth (WIP)
6. Aegis IceWind (WIP)

1.

Quickmagic (0.5s)– can be cast with 1 empty hand. Uses minimal Mana

1. **Projectiles –** Ranged attacks
   • Fireball
   • WraithBolt
   • Storm Bolts
   • Guided Arrow

Requires extra mana

2.

Infused EX Quickmagic (0.5s)– enhanced 1h spells, uses more mana, deals more damage, AOE effects

1. **EX Projectiles-** enhanced projectiles
   • Immolating Blast
   • Wraith Swarm
   • Ice Swarm
   • Piercing Lance

Requires extra mana

Greatspells (1+s cast time)– requires 2 empty hands
- no weapon or shield

1. **Summoning and AOE Skills**
   Requires Enchanted Aura
   • Summon Fire Demon
   • Summon Glyph of Desecration
   • Summon Blizzard
   • Summon Consecrated Circle

Consumes Glyph/Circle

Depleting GreatSpells- (0-2s cast time)
- Requires consuming of Enchanted Aura and Summoned effects
- Increased time to cast delayed due to need to cast Quickspell Aura and Greatspell Summon

2. **Enchanted Aura –** enhances Melee skills
- Extra damage, magical attacks, debuff target
- Fades/Consumed after ~5-10 blocked attacks
   • FlameSword
   • Cursed Sword
   • Frozen Blade
   • Blessed Blade
   • Guardian Barrier

Consumes Enchantment

1. **Meteor Storm –** powerful AOE spell
   Requires FlameSword and 2s cast-time

2. **Abyssal Vortex –** powerful AOE Curse and DOT
   Requires Cursed Blade and Circle of Desecration

3. **Lightning Storm –** powerful AOE hits all in area
   Requires Frozen Blade, lots of energy/mana

4. **Heavens Gate –** powerful AOE Heal
   Requires Blessed Blade and Consecrated Circle

Quickmagic (0.5s)– can be cast with 1 empty hand. Uses minimal Mana

Requires extra mana →

Infused EX Quickmagic (0.5s)– enhanced 1h spells, uses more mana, deals more damage, AOE effects

Requires extra mana Requires 2 empty hands →

Greatspells (1+s cast time)– requires 2 empty hands
- no weapon or shield

Chaosflame – highest dps ~140%
- Flies quickly in straight-line
- Deals small aoe explosive damage
- Burns targets for ~1/3 of damage over 3s
- **Enchantment Aura** - adds 130% dps
- Burns targets for ~1/3 of damage
- Increases Fire damage by 10-30%

Blackflame – Seeking projectiles 120%
- Flies slowing in seeking line
- Curse+DOT damage for over 5s
- Deals very little hitstun
- **Enchantment Aura** - adds 120% dps
- Curses target reduce target damage 20-30%
- Increases Shadow damage by 10-30%

Iceflame – slows target 10-30%
- 3-5 ice shards fly at target for 120%
- Wide spread of upfront damage
- Slows target 2s and highest hitstun
- **Enchantment Aura** - adds 120% dps
- Slows target and deals ice damage
- Increases Ice damage by 10-30%

TrueSight – Sniper dps ~130%
- High reload and flies quickly
- Deals single-target damage only
- Marks them for tracking and hunting
- **Enchantment Aura** - adds 130% dps
- Heals self for ~1-10% of damage dealt
- Shoots 2+ projectiles rapidly
- Increases Holy damage by 10-30%

Guardian Shield (requires shield)
- Parry damage +50%
- Temporarily block effectiveness +100%
- Magic Resistance +50%
- Generate Mana and Energy on block while active

Immolating Blast – large AOE 200% dps
- Throw arcing fireorb that explodes into fire AOE
- Large 10foot aoe burns on floor for 5s
- Burns targets for ~1/3 of damage over 3s
- **With Enchant Aura-** +30% dmg
- Semi-seeking Fireorb follows target
- Blast is larger and fire burns for +30% damage

Wraith Swarm– Seeking projectiles 200% dps
- Quickly flieing swarm of 3-10 projectiles
- Curse+DOT damage for over 5s
- Deals more hitstun
- **With Enchant Aura-** +20% dmg
- Piercing Dark Orb flies straight through enemies
- Each curse hits for additional hitstun

Ice Swarm– piercing projectile fan 200% dps
- 5-10 storm swords fly at target and pierces all
- Wide spread of upfront damage
- Slows target 2s and high hitstun
- **With Enchant Aura-** +30% dmg
- More shards active
- Semi-seeking shards, small ice aoe on hit

Piercing Lance – Piercing ~200%
- Piercing lance is large and deals wide damage
- Increased hitstun
- **With Enchant Aura-** +30% dmg double throw
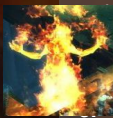- Throw 2 lances in quick succession

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Summon Meteor– (1s) meteor forms and grows as you cast
- Recast to quickly slam down Meteor for 400% dmg

Summon Blizzard– (1s) large AOE Dot for 500%
- Summon storm that hits all in area with spinning ice shards

Summon Fire Demon- Aggressive burning golem charges
Ice Golem- Spiky slow ice humanoid, throws ice hands
Summon Black Hydra- tentacles/heads spits wraithballs

Summon Fire Gate - enhances fire spells/damage/efficiency
- Local burning glyph dot, quickens casting

Summon Glyph of Desecration – throw large Curse Glyph
- Curses those within range, recast to increase diameter

Summon Ice Armor- freezes armor swirling ice around self
- Deals cold to attackers, has cold temporary health barrier

Summon Consecrated Circle – heals and deals more damage
- Local glyph, Attacks heal within circle, enhances attacks/projectiles

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Consumes Glyph/Circle →

Depleting GreatSpells- (0-2s cast time)
- Requires consuming of Enchanted Aura and Summoned effects
- Increased time to cast delayed due to need to cast Quickspell Aura and Greatspell Summon

Meteor Swarm– Meteor falls on every enemy in area
- Local glyph, Attacks heal within circle, enhances attacks/projectiles

Abyssal Gate– Summons black hole vortex infront
- Short range grapple, Blockbreak / sucks in all in area

FlashHurricane– Storm forms around you (or infront) dps all
- Local glyph, Attacks heal within circle, enhances attacks/projectiles

Fist of Heaven– Teleport to slam down in powerful multihit AOE
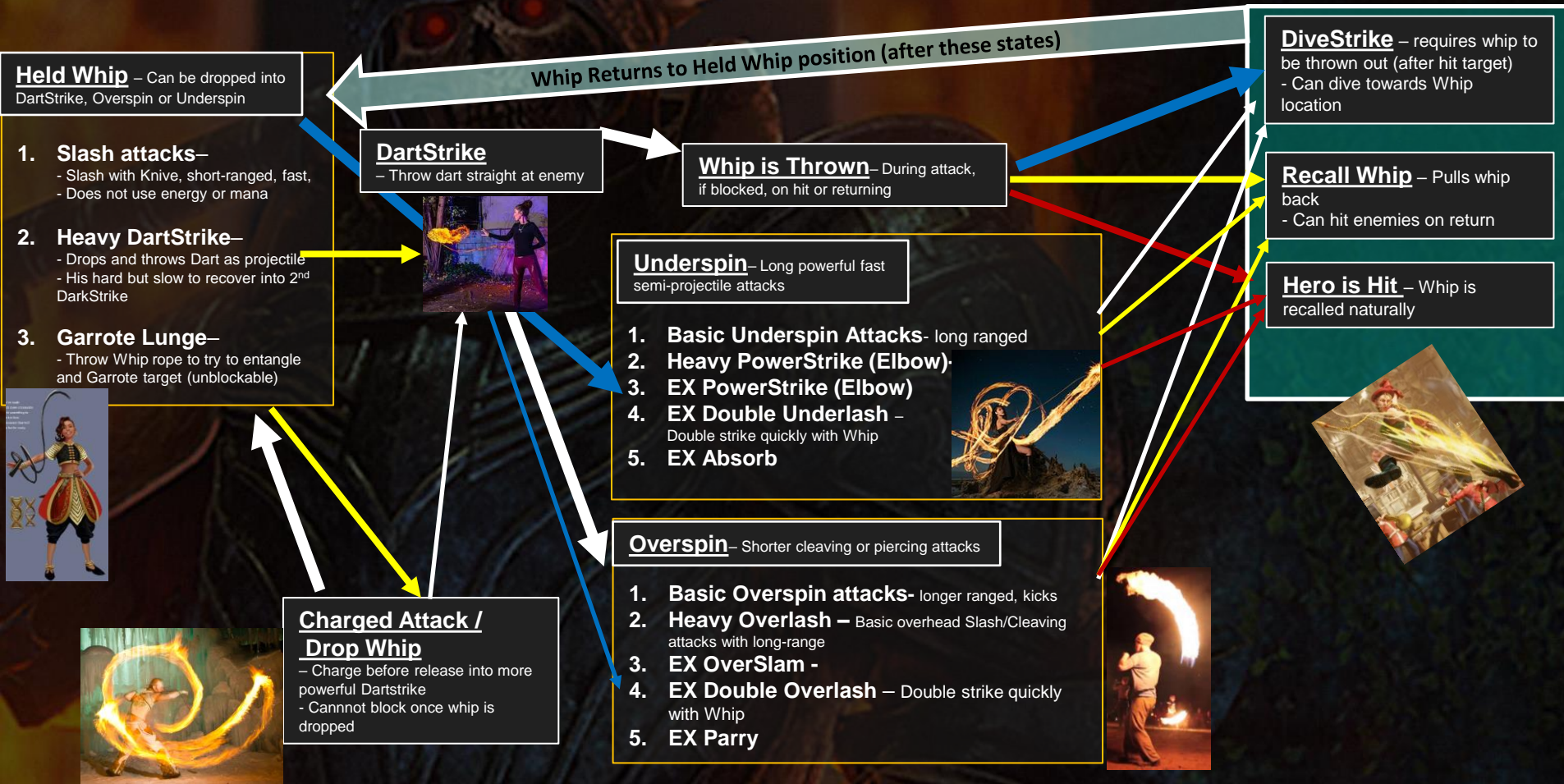- Stuns target area on Startup until fist lands, can be blocked

Heavens Gate– Consecrated circle heals all over 10s
- Damage taken while in circle becomes Grey Damage, cannot die inside

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Consumes Enchantment →

RopeDart Combat Mechanics– Held Whip, Overspin, Underspin, Lash and DartStrikes, Divestrike
20200727

Whip Returns to Held Whip position (after these states)

Held Whip – Can be dropped into DartStrike, Overspin or Underspin

1. **Slash attacks**–
   - Slash with Knive, short-ranged, fast,
   - Does not use energy or mana

2. **Heavy DartStrike**–
   - Drops and throws Dart as projectile
   - His hard but slow to recover into 2nd DarkStrike

3. **Garrote Lunge**–
   - Throw Whip rope to try to entangle and Garrote target (unblockable)

DartStrike
– Throw dart straight at enemy

Whip is Thrown– During attack, if blocked, on hit or returning

DiveStrike – requires whip to be thrown out (after hit target)
- Can dive towards Whip location

Recall Whip – Pulls whip back
- Can hit enemies on return

Hero is Hit – Whip is recalled naturally

Underspin– Long powerful fast semi-projectile attacks

1. **Basic Underspin Attacks**- long ranged
2. **Heavy PowerStrike (Elbow)**·
3. **EX PowerStrike (Elbow)**
4. **EX Double Underlash** –
   Double strike quickly with Whip
5. **EX Absorb**

Overspin– Shorter cleaving or piercing attacks

1. **Basic Overspin attacks-** longer ranged, kicks
2. **Heavy Overlash –** Basic overhead Slash/Cleaving attacks with long-range
3. **EX OverSlam -**
4. **EX Double Overlash** – Double strike quickly with Whip
5. **EX Parry**

**Charged Attack /
 Drop Whip**
– Charge before release into more powerful Dartstrike
- Cannnot block once whip is dropped

Balancing Combat Ranges 20200512

Pure Magic Style
Required for Greater Spells
Lower armor – poor block
Very limited melee attacks
Good Mobility

Mage Playstyle
- Most 2 handed spells are immobile for 1-10 seconds
  - Most healing spells and AOE spells require 2 hands
- Greater magic does huge AOE magic that targets enemies and causes a lot of destruction
- At higher levels, Magic staff or weapon can count as open hand to cast spells

Main Skills
- LMB = Staff fireball, or double normal Quickspell fireball
- Offhand = Quickspell spells
- Magic = slow charged, channeled spells that summon storms, summons, AOE

Pros-
- Great sniping and sneaked damage with targeted spells (often seeking or instant/cannot miss spells)
- Best AOE damage if not spotted

Cons-
- Slow and uneffective at melee range (will get interrupted)
- Mana dependent
- Limited melee damage
- Limited defense and bad block

Archer Style
2 hand bow/crossbow/gun
Required for fastest projectiles from Bow
Can switch to 1hand Quickmagic easily
Lower armor – poor block
Very limited melee attacks
Good Mobility

Archer Playstyle
- Long-range unlimited Range attacks
- Often locked into close over the shoulder camera.
  - Zooming in a lot to try for headshots
- Is constantly walking or strafing to mix regular bow attacks with Magic enhanced arrows or Quickspell attacks

Main skills
- LMB = Arrow shot ~1-2/s per second
- Offhand = Parry, bow pokes, kicks
- Magic = piercing flaming arrows, multishot arrows

Pros-
- Great sniping and sneaking ranged damage
- Great mobile piercing group damage
- Can mix Arrows (use Energy) with Magic (uses Mana)

Cons
- Requires skill to quickly aim headshots while in movement and combat
- All arrows blocked by blocking or shielded enemies
- Limited group damage, piercing attacks only
- Limited melee damage
- Limited defense and bad block

Weapon only – Longsword, Polearm,
Can switch to 1hand Quickmagic easily
Lower armor – weapon block better than no block
Best melee damage and abilities
Good Mobility

Weapon only Playstyle
- Mixes melee quickness and high damage attacks with Quickspell magic
- Often dashing in and out of melee range to use magic and attack with powerful melee attacks

Main skills
- LMB = Arrow shot ~1-2/s per second
- Offhand = Parry, bow pokes, kicks
- Magic = piercing flaming arrows, multishot arrows

Pros-
- Best overall Melee and Magic damage
- Mobile and best melee Sneak damage
- Can quickly cast magic with Quickspell magic with left hand
- Can mix melee weapon (uses Energy) with Magic (uses mana)

Cons
- Requires high skill to manage melee gr
- Quickspells have limited range
- Limited defense and bad block

Sword and Shield
Required for shield
Best Armor, Defense, and HP
Good Melee abilites with Shielded/Armored attacks
Slowest movement

Weapon+Shield Playstyle
- Heavily armored and many defensive skills
- Can block and attack with Shield (uses energy)
- Generally requires good gear but then becomes a bully in melee as he armors through projectiles and attacks to defeat enemies
- Great players often switch out shield for magic

Main skills
- LMB = Arrow shot ~1-2/s per second
- Offhand = Parry, bow pokes, kicks
- Magic = piercing flaming arrows, multishot arrows

Pros-
- Easy to play and best for beginners
- Best HP, Armor, and defensive options
- Many armored and uninterruptable attacks

Cons
- No ranged attacks
- No Magic, Needs to switch out shield to use magic for ranged quickmagic
- Needs to swap out shield to drink potions

Dual Weapon Style-
Best melee damage
Limited block
Same limitations as Shield
Can swap out both weapons faster than Shield+Sword

ATTACK – Startup Animation

Start Attack Startup animation (may blend)
- Player locked out of further inputs for WASD
- Player camera continues to be mobile
- Attack may be cancellable into other actions but generally cannot be cancelled into combos until after Active hitbox

Player starts lifting sword or moving forward to attack
- May need to calculate how far he should move forward to get to nearest target
  - This is new feature as currently not working
  - If target is near, he hops/dashes less distance
  - He should always go in WASD direction
  - If target is slightly to one side, he should adjust his attack up to 45degrees to either side but no more

- Player's Collision and Hurtbox (sphere) may need to Change (expand/contract or change to square) to match his pose
  - Square Collision push all targets forward
  - Hurtbox is for taking damage

ATTACK – Startup Animation

Spawning Active "hitbox" to deal damage – maybe detecting enemies by "line-draw" in technical terms be similar
- As we don't detect hits with limbs, we should also detect if there are short enemies that are below hitbox that need to get hit
- Player generally continues to be locked in animation and can only control camera

Dealing damage– if "Hitbox" overlaps with enemy Hurtbox, check all enemies hit on the frame for the below. All effects happen at the same time
- **Not blocking** – then deal damage and generally deal Recovery animation
  - Check for defense, resistances
  - Weak Enemy recovery animation is generally set by Attacker
    - Modifiers may make hitstun/damage even higher/lower than normal
  - Hero's and Champions have standard short recovery animations
  - Bosses may have no hitstun (animations on face only), or special short or longer Hit Recovery modifiers
- **Blocking** – then check for blockbreak, pushback, partial damage, magic effects
  - This will inflict a **pushback** effect that varies by enemy. A shielded enemy with back next to wall will push you back more
  - **Pushback** does not stack, and largest pushback effect takes precedence
  - **Pushback** generally does not start until after Active frames are finished
  - **Pushback** is generally not linear and may (start slow, get faster, and end slow, or be more linear decay)
- **Parry/Counterattack-** any counterattack effects? This may inflict Parried Stun status, or negate target attack entirely

Auto-hit Thrusts (Not working) – on Active, the computer should detect if there is any enemy within a 90 degree arc infront that has an enemy within range.
- Check for an overlap that allows a maximum number of enemies to be hit by same Thrust
- Put in memory who was hit as those that are hit may be chosen not to be priority on next "Thrust"
- Chosen target(s) are always hit as character will adjust thrust to put up/down/left/right 45 degrees to hit those targets who must block/parry/dodge

ATTACK, COMBO, and HIT – Recovery Animation

Attack Recovery – after active hitbox, recovery animation starts and is generally rooted in ground
- There may be some leeway in ending this animation early depending on skills
- Some skills may play an excessively long animation 1+ second for flair (like a taunt) if player does not move or input anything during the Recovery

Combo Recovery and Cancelling – most combos and auto-combos (aka Rekkas) will cancel the original Attack Recovery right after the Active hitbox ends (given the correct input was put in on time)
- The Combo immediately go into the next attack animation without a need to finish the original Attack Recovery animation
- There are many combos, which generally need to be hardcoded into the Transition table to know what can cancel which attacks
- Autocombos have a running counter to know which attack they are on so until the Player returns to idle, their Autocombo counter is not reset
  - Autocombos generally max out at 4-5 hits and then they can cancel into Special Moves (requiring Mana) which limits the maximum amount of hits in a combo
  - These counters may be needed in order to not allow infinite combos or infinite cancelling of one attack into another
  - A counter may also be counting which attacks have been used by the player and not allow reuse of the same attack during the same combo

Hit Recovery – If player or enemy is hit, they go into Hit Recovery where they generally cannot move until the recovery ends
- There are many types of Hit Recovery depending on when you were hit, if you were hit from behind, or hit when running forward, you may be Counterhit into Crushed Stun status which lasts a lot longer
- Grapple, Guardcrush, Shieldbreak, and Parry – are all specialized types of Hit Recovery that are triggered when certain attacks hit you at a specific time

Gems and Sockets below are low priority

- They essentially can be ignored until much later as crafting is not needed for initial Demos

Enchantment – Gems and Sockets

20201014

Gems Basics

Each Gem comes in ~8 Types and ~9 Qualities,
- Gems of the same Quality may have different innate spells *(see chart)*
- Gems generate different Enchantments depending on the item Slot they are socketed into
- Higher Quality Gems are more effective and add higher Damage, Proc %, or other effects
- Gem Enchantments even at the same level vary within a range 3-6, *(see Chart below as spells may vary as well)*

1. Socket-able items – Sockets must be in a Weapon, Shield, or Armor
- Items may spawn with 0-6 max sockets (6 at high level only)
- Socketing is very permanent and is costly to unsocket (see Crafting Recipes)

Other than Gems- we plan for Runes and Runewords later

Type	Power	Weapon Slot	Shield Slot	Armor	Crafting
1. Diamond	*Purification - Resistance*	Enhance Damage	Resistance	Enhanced Armor	*Enhancing Base Stats or Magic*
2. Black Opal	*Void - Curses*	+X Mana on kill +X Mana on hit +X Manasteal	Curse Thorns Curse Weaken Curse Amplify	Absorption	*Adding wider AOE effects*
3. Blood Topaz	*Healing - Strength*	+X life on kill +X life on hit +X Lifesteal	Regenerate Health	+X Strength	*Adding Healing/Defense*
4. Flame Ruby	*Fire - Mana*	+X Fire damage	Regenerate Mana Mana on Block/Parry	+X Mana Regen +X% Mana Refund	*Adding damage*
5. Ice Sapphire	*Ice - Dexterity*	+X Ice damage	Improved Block Improved Parry	+X Dexterity	*Adding stun, Quicken speed*
6. Sunstone	*Lightning - Affinity*	+X Lighting damage	Blessing	+X Affiinity	*Adding damage*
7. Moon Jade	*Poison - Vitality*	+X Poison damage	Proc Poison	+X Vitality	*Adding Poison or Duration*

Gem Quality

1. Raw Gem Quality – from common to very rare
1. Chipped – very common
2. Cracked
3. Flawed
4. Shard
5. Stone
6. Pure
7. Flawless
8. Perfect
9. Star - nearly impossibily rare

Gem Drops + Crafting

1. Drops from Enemies and Rewards
- Drops are common from bosses/champions

2. Disenchantment
- Items can be disenchanted into gems and scrap
- Poor items can only drop 1 chipped
- Rare or better items can drop multiple gems

3. Crafting Recipes
- **Upgrade Gem=** 3 Gems of same Type+Quality
-   **Upgrade Pure Gem** = 5+ Gems required
- **Reroll Gem=** Diamond dust + Gem
- **Unsocket =** Black opal of same quality, destroys item and unsocket gems
- **Craft Rune=** Gem + Gold + Scroll of Rune Recipe
- **Runeword** = Rune + Rune + item = powerful item

4. Vendor Trading
- Trade 3 of 1 gem for 1 of another of same quality
- Buy Diamond Dust for crafting
- Buy use Scrap and Ore for crafting/restoring items to former glory (Tungsten/Volfram, Gold/Aurum, Silver/Argentum, Titanium/Titanite, Niobium/Niobe, Mecury/Hyragium, Prometheum, Dysprosium, Tantalum)
  - Fire Forged, Dragon Forged, Hell Forged

Enchantment – Quality progression

20201015

1. Types – Currently 8 types of Socketable items
- **Gems-** first class of socketable item, themed around precious stones
  - Comes in common weaker gems and powerful very-rare gems
    - All 8 types of Gems are generally the same in rarity
  - All 8 types of gems come in Quality ratings
    - All Gems of the same quality should be of similar power
  - Can combine 3 gems of same Type and Quality combine to the same Gem of a +1 higher Quality
- **Runes** (planned)- small socketable-items infused with magic and enchantments
  - More powerful than Gems but only one set of Runes and all Runes are of the same power and effect
  - Named for symbols: eg. El, Thul, Lum, Ral, Ort, Tal, etc.
  - Socketing Runes in a specific order in a specific item creates a Runeword item which is among the most powerful items (depending on base item)

2. Attributes – Details of the enchantments on each Gem
- **Gems Enchantments** – determined by the following
  - Types of Gem – eg. Black Opal
  - Slot which Gem is placed – Weapon, Shield, or Armor
  - Quality of Gem – Chipped to Star
  - Chance by Slot – up to 3 types of enchantments per slot
  - Chance within range – generally small 1-2% range per enchantment
- **Rune Enchantments** – will be determined similar to gem enchantments
  - By Item type (narrower than Gems)
    - Rune quality is not relevant, only Rune name/type
  - **Runewords**– runewords are powerful and enchant items with 5-10 set enchantments. The power of the enchantments will vary within a large range (difficult to get perfect roll

3. Function – Adding enchantments to Items (weapons, shields, armor)
- **Disenchanting-** when you have items you like, you can destroy item to get a Gem, the gem should be related to the item enchantment.
  - You can use gem to socket your preferred item with similar enchantment
- Use for Recipes = eg. Upgrade item type, swap item enchantments, reroll item enchantemnts

4. Possible Interactions – gem+gem, sacrifice gem, gem+crafting items
- **Conversion or Swaps** – covert 3 lower quality gems to higher quality, Converting Gem A to Gem B
- **Adding Sockets** – Add or max out sockets available in item
- **Changing/Improving enchantments-** reroll enchantment to get better enchantment or improve "roll"
- **Creating/Upgrading Runes** – Gems plus recipes can help create the runes you want. Runes can be upgraded but also require 3 lesser runes to upgrade to better rune
- **Bind to Player-** binds item to your character permanently (increases stats, but cannot traded later)

Type	Quality	Weapon Slot	Shield Slot	Armor
Black Opal	*Chipped*	+1-2 Fire damage	Regen Mana +5-10% 10-30% 1 Mana on Block 20-50% 1 Mana on Parry	+1 Mana Regen /5s +1-2% Mana Refund
	Cracked x3 = 3 chipped	+2-3 Fire damage	Regen Mana +10-15% 30-75% 1 Mana on Block 50-90% 1 Mana on Parry	+2 Mana Regen /5s +2-3% Mana Refund
	Flawed x3 = 9 chipped	+3-4 Fire damage	Regen Mana +15-20% 1 Mana on Block 2 Mana on Parry	+3 Mana Regen /5s +3-4% Mana Refund
	Shard x3 = 27 chipped	+4-5 Fire damage	Regen Mana +20-25% 2 Mana on Block 3 Mana on Parry	+4 Mana Regen /5s +4-5% Mana Refund
	Stone x3 = 81 chipped	+5-6 Fire damage	Regen Mana +25-30% 3 Mana on Block 4 Mana on Parry	+5 Mana Regen /5s +5-6% Mana Refund
	Pure X3 = 243 chipped	+6-7 Fire damage	Regen Mana +30-35% 4 Mana on Block 5 Mana on Parry	+6 Mana Regen /5s +6-7% Mana Refund
	Flawless x5 = 1215 chipped	+7-9 Fire damage	Regen Mana +35-45% 4-6 Mana on Block 5-7 Mana on Parry	+8 Mana Regen /5s +7-10% Mana Refund
	Perfect x5 = 6075 chipped	+9-11 Fire damage	Regen Mana +45-60% 6-8 Mana on Block 7-9 Mana on Parry	+10 Mana Regen /5s +10-13% Mana Refund
	Star x5 = 30375 chipped	+11-15 Fire damage	Regen Mana +60-75% 8-10 Mana on Block 9-12 Mana on Parry	+12 Mana Regen /5s +13-16% Mana Refund

Input types - button map

Single buttons Action
Main Weapon
Offhand
Magic

Block

Modifier buttons
Sprint
Block
WASD (Front,Left,Back,Left)

Combat mode toggle

States
Idle
Walking
Sprinting
Dashing – modifies attacks
Blocking

Attacking – Startup
Attacking – Active
Attacking – Recovery

Jumping – in air
(Dashing – may be in air)

Knockdown – in air
Knockdown – on floor
Knockdown – rolling
Knockdown – getting up

Aiming –
When activating ranged Magic or Ranged weapons, Camera should move to over the right shoulder to line up attacks to "crosshairs"
- Some movement (slow walk) may be allowed depending on skill
- Camera is generally tied to the crosshairs and turning more than 180 may cancel the Aiming/magic effect
- This can also be done in the air like Zelda to allow high skill

Attack Stances
Weapon raised
Weapon sheathed

Shield out
Shield sheathed

Magic active

Buff States
Enchanted Weapon
Armored (decreases physical damage)

Armored
Invincible
Uninterruptable

Parry - all
Parry – Projectile only
Parry – Light only

Ignore melee
Ignore Projectiles

Block –
Block – crushable by heavy

Rolling – roll through some enemies
Narrow – narrows hitbox
Ducking – lower hitbox

Invisible – full
Stealth – silent but not invisible

Attack Modifiers
Magic Damage
- Fire
- Ice
- Shadowflame
- Holy
- Poison

Physical Damage
- Blunt
- Piercing
- Slashing

Area of Effect
Passive damage

Unblockable

Light attack
Medium attack
Heavy attack

Multihit projectile

Debuff and DOT States
- Can stack 1-5max
- Decays over time, eg. Lose after 3s

Poisoned
Burning
Frost
- Frozen
- Rooted
Marked by Light
Cursed
- Multiple types of curse

Dazed
Stunned
Blockbreak
Shieldbreak – break/drop shield

Sleeping
- Unconcious
Laying down
Sitting
Eating

Spell and Projectile Modifiers
Minor projectile – can be deflected by attack
Major projectile – cannot be deflected by attack
Magic projectile – triggers effect on hit

Static Projectile or Spell – Area of effect
- May be explosion, trap, bomb, poison cloud, can be negated
- May expire after X seconds, pulse with DOT damage, etc

Piercing Projectile – may piece targets and continue

Camera

- Guide and ideas which requires tuning
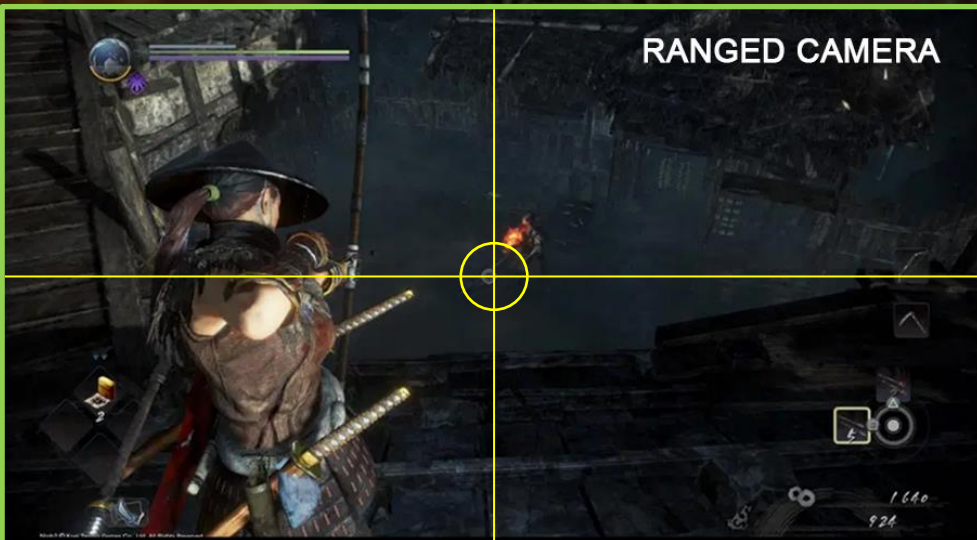
Melee Camera

Targeting and Camera

Notes: Yellow circle overlay is purely for reference to know where center of screen is

Smoothed Lagging camera Feature- camera follows player movement 0.1-0.5s when moving Forward/Back/Left/Right/Up/Down. No lag when player turns left/right
- There is a maximum lag of say 2m to left/back/up/down and 3m to right/front to ensure player stays on screen
- This applies primarily to Melee Stance
- In Ranged Stance, lag is reduced to maximum 0.5m in each direction, Player head should not be allow to reach middle of screen and block target

- **Melee Stance (1hand Weapon and Weapon+Shield)**
  1. **Camera -** Zoomed in to show head to hip.
      1. Align Center of screen with hand and arrow.
      - The camera is fully tied to movement as in proper FPS
      - Tip of the bow may "bounce" or waver to indicate low aim

  2. **Targeting (unlocked)–** 180 degree autotargeting,
      - Priority given to enemies at center of screen
      - SHIFT/EX/Aimed attacks are unassisted, always targeting your camera center

  3. **Targeting (Locked)–** 100% autotargeting, will lock camera at target,
      - Player body can still turn in any direction to run full speed
      - Attacking or Shooting projectiles will automatically target Locked Target without delay

RANGED CAMERA

MAGIC CAMERA

THE WITCHER
WILD HUNT

Targeting and Camera

Notes: Yellow circle overlay is purely for reference to know where center of screen is

Smoothed Lagging camera Feature- camera follows player movement 0.1-0.5s when moving Forward/Back/Left/Right/Up/Down. No lag when player turns left/right
- There is a maximum lag of say 2m to left/back/up/down and 3m to right/front to ensure player stays on screen
- This applies primarily to Melee Stance
- In Ranged Stance, lag is reduced to maximum 0.5m in each direction, Player head should not be allow to reach middle of screen and block target

- **Ranged Stance (Bow and Unarmed) –** LMB or Fireball
  1. **Camera -** Zoomed in to show head to knees (when standing straight). Align Center of screen with top of shoulders/spine.
     - Player can run in any direction at full speed and player body will turn away from camera to run in that direction

  2. **Targeting (unlocked)–** no autotargeting, shoots fireball at center of screen

  3. **Targeting (Locked)–** 100% autotargeting, will lock camera at target,
     - player body can still turn in any direction to run full speed, shooting will automatically target Locked Target without delay

- **Aiming Stance (Bow or throw weapon) -** Hold RMB
  1. **Camera -** Zoomed in to show head to hip.
     - Align Center of screen with hand and arrow.
     - The camera is fully tied to movement as in proper FPS
     - Tip of the bow may "bounce" or waver to indicate low aim
     - Player Body and Head cannot turn away from camera

  2. **Targeting (unlocked or unlocked)–** same for both
     - All projectiles (arrow, spell, AOE) target the center of the screen
     - Movement speed is reduced and lateral/jumping movements are reduced as moving backwards/sideways when facing forward is slower
     - AOE aiming will have a glowing Cylinder/Sphere for targeting
       - Bright if within range
       - If thrown a "throw arc" should be projected for current testing (need code to adjust targeting if throw arc will hit roof/obstacle)
       - Grey/Red if invalid or out of range

Zooming Camera
(MMB) Middle-Mouse-Button scrollwheel
1. **Unarmed and Bow–** Can zoom out or in
   - Zoomed In- to almost same as Aiming Ranged to see only down to hip
   - Zoomed Out- head to toe takes up ~1/4 of total screen
2. **Melee –** Can zoom out or in
   - Zoomed in further to show hip and no more
   - Center of screen should be level with the top of the left-hand and eye-level with the player
3. **Aiming Ranged-** *Cannot* zoom out or in
   - Must be zoomed in when aiming
   - Some spells/weapons may allow zooming in a bit more (to customize later)

Parralax Camera
- Parralax should be noticeable for any spell cast from Left hand or originating not from right arm (magic projectiles from above etc.)
  - **Vertical Parralax**
    - Throw spell from above
    - AOE and Summoned storms/orbs from above
    - When Targeting locked, Should target middle of target and expected to hit floor near target
    - Player needs to Unlock Targetting and aim manually to hit target area
  - **Horizontal Parralax**
    - Spells thrown from left hand or Bow which has only slight parallax
    - Target should be middle of target in Locked or exactly at where Center of screen overlaps with target (so all else the same, aiming at infinity and aiming at a creature close to you will be different)

Aim and In-Air Fireball/Bow
Shooting-in-air is allowed and encouraged
See game Spellbreak for open-arena jumping spells and projectiles
1. **Bow in air–** bow is slightly lowered and zoom is slightly zoomed out when jumping
   - **Quickshot Unaimed** – same speed as on ground
     - Poor aim ~5 degree random change to aim
     - Range of shot generally limited to 40 yards max
   - **Fully Aimed Shot** – requires full aim animation for max effect
     - Aim and damage much better with ~1 degree range
   - **Magic or EX shot** – requires Mana to enhance attack
     - Aim is 100% accurate assuming projectile can fly far enough (many projectiles have limited range)
   - **Grounded Quickshot Unaimed –** 1+ degree aim range
     - If running/moving/dashing, often aim is off 5-10degrees
   - **Grounded Aimed or Magic/EX shot-** 100% accurate aim as long as not moving

2. **Fireballs in air–** Camera slightly zoomed out when jumping
   - **Quickshot Unaimed Fireballs** – generally act the same and fly at similar speed (not damage/flight speed will vary by speed/skill)
     - Poor aim ~5-10 degrees random change to aim
     - Range of shot generally limited to 40 yards max
   - **Enhanced/EX shot**– requires animation to complete spell
     - If animation not complete until landing on ground, spell-cast is interrupted and nothing comes out.
     - Most spells cannot start on ground and jump while casting
     - Aim is 100% accurate assuming projectile can fly far enough (many projectiles have limited range)
   - **Grounded Quickshot Fireball –** 1-5 degree aim range
     - If running/moving/dashing, often aim is off 5-10degrees

3. **AOE Spells in air–** Continue to require Cylinder/sphere for aiming
   - Camera zoomed out
   - Aim is generally 100% accurate as magic is guided

NAVIGATION CAMERA

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Empty hands or Focus item (orb, wand, staff, book, skull, etc)

- **Magic Stance –** increases speed of magic casting. Required for Greater spells.
- **Focus =** item that reduces cost of spells, may increase power when held

Press MMB+"R"

2.

Unarmed Navigation

- ### Camera
  1. Zoomed out the widest
     - **Sprint-** zooms out camera even more (already in game)
     - **Dash-** camera lags a little so that if the player dashes right, the player moves first and the camera catches up as the Dash ends (this is not in game)
  2. Directly behind with center of screen just above top of head
  3. The absolute center of screen should be 1 head above top of players head
  4. Any minor items between player and camera should be turned transparent (may be added later as a feature)
  5. When looking up or down, the camera should still keep from needing to look through character (Reference Zelda BOTW camera)

  6. Looking Up – Character should fade out to allow looking through character with camera at feet of character to give good vision of ceiling without being too close to the ceiling (this will likely require work later)
  7. Looking Down - Camera will zoom out with roughly 15m on all sides. This is go to give good view of the ground for jumping and puzzles. Zelda has good references of this)

- ### State modifiers
  1. **Fastest movement** (100% current speed)
  2. **Block-** weakest block, blocks with arms, ~50% damage is fully blocked, 30% damage taken as temporary grey damage

  3. Can quickly draw weapons into any other state
     - Drawing weapon from unarmed state gives special attacks that hit harder and wider
     - Some special attacks end with sheathing weapon
     - Transition into unarmed state from holding weapons is faster than going into Bow

  4. **Potion or Items** - Can drink potion with left-hand with no delay
     - Can combo into drink potion

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COMBAT CAMERA

Shield + Weapon or 2 weapons

- **Shield+Weapon –** improves block ability and armor, very slow attacks with heavy 2handed weapons
- **2 Weapon Stance –** Allows quick multi-attacks for 1 handed weapons
- Cannot cast Quickmagic or drink potion without unequipping Shield
  - Automatically unequips shield for QuickMagic and drink potion/item
  - Automatically re-equips shield after

Press MMB+LMB+RMB

1 or 2 handed weapons (longsword, dagger, axe, poleaxe, greatsword, staff, etc)

- **One Weapon Stance –** Allows mix of Melee and magic
- Can only cast Quickmagic spells
- Can hold Focus in left hand if 1 handed weapon
- If 2handed weapon like Poleaxe, holding Focus in left hand forces 2 Weapon stance

Press MMB+LMB

Combat Navigation

- ## Camera
  1. Slightly zooms in a bit more but definitely shows feet
  2. Directly behind with center of screen just above top of head
  3. The absolute center of screen should be 1 head above top of players head
  4. Any minor items between player and camera should be turned transparent (may be added later as a feature)
  5. When looking up or down, the camera should still keep from needing to look through character (Reference Zelda BOTW camera)

  6. **Looking Up** – Character should fade out to allow looking through character with camera at feet of character to give good vision of ceiling without being too close to the ceiling (this will likely require work later)
  7. Looking Down - Camera will zoom out with roughly 15m on all sides. This is go to give good view of the ground for jumping and puzzles. Zelda has good references of this)

- ## State modifiers
  1. Movement speed depends on weapon equiped
     - 1hand weapon- almost as fast as unarmed (95% current speed)
     - 2hand weapon- slightly slower (90% current speed)
     - Shield+Weapon- slowest (85% current speed)
  2. **Weapon Block** – better block than unarmed, ~60-80% damage is blocked with 10-30% grey
     1. Small Weapon (eg. Dagger)= 60% damage blocked, 30%grey
     2. Medium Weapon (eg. Longsword)= 70% damage blocked, 20%grey
     3. Large Weapon (eg. Poleaxe)= 75% damage blocked, 15%grey
     4. Small Shield+Weapon = 85% damaged blocked, 10% grey
     5. Tower Shield+Weapon = 90% damaged blocked, 5% grey
        - No Quickmagic, needs to unequip shield to cast magic or drink potion

  3. Can still cast QuickMagic if have empty left hand
     - This works with both 1 handed and 2 handed weapons
     - No delay between switching to/from Quickmagic

  4. **Potion or Items** - Can drink potion with left-hand with no delay
     - If not holding shield Can combo into drink potion
     - If holding shield has 0.5s delay unequipping shield to drink potion
     - Leaves player without shield if Player is hit when drinking potion

1 or 2 handed weapons (longsword, dagger, axe, poleaxe, greatsword, staff, etc)

- **One Weapon Stance –** Allows mix of Melee and magic
- Can only cast Quickmagic spells
- Can hold Focus in left hand if 1 handed weapon
- If 2handed weapon like Poleaxe, holding Focus in left hand forces 2 Weapon stance

Press MMB+LMB

Magic Navigation

- **Camera**
  1. Zoomed in camera cutting out just below knees
     - Holding down magic button allows aiming of magic
     - Depending on spell may zoom in as much as
  2. Directly behind with center of screen just above top of head
  3. The absolute center of screen should be 1 head above top of players head
  4. Any minor items between player and camera should be turned transparent (may be added later as a feature)
  5. When looking up or down, the camera should still keep from needing to look through character (Reference Zelda BOTW camera)

  6. **Looking Up** – Character should fade out to allow looking through character with camera at feet of character to give good vision of ceiling without being too close to the ceiling (this will likely require work later)
  7. **Looking Down** - Camera will zoom out with roughly 15m on all sides. This is go to give good view of the ground for jumping and puzzles. Zelda has good references of this)

- **State modifiers**
  1. Movement speed depends on weapon equipped on right hand
     - See movement speeds depending on weapon held
     - AIMING MAGIC= HOLD magic to aim spell for charged fireball or aiming AOE or other effects
  2. **Block** - depends on weapon if equipped on right hand

  3. No delay if going back to 1 or 2 handed weapon

  4. **Potion or Items** - Can drink potion with left-hand with no delay
     - Can combo into drink potion

Ranged Navigation

- **Camera**
  1. **Bow slightly lowered –** when walking around bow is slightly lowered but camera is zoomed in
     - Zoomed in same as Magic Camera
     - Small circle should be shown for middle of screen
  2. **Aiming Bow – HOLD+LMB**
     - Zoomed in further to show hip and no more
     - Center of screen should be level with the top of the left-hand and eye-level with the player
  3. Directly behind with center of screen just above top of head
  4. The absolute center of screen should be 1 head above top of players head
  5. Any minor items between player and camera should be turned transparent (may be added later as a feature)
  6. When looking up or down, the camera should still keep from needing to look through character (Reference Zelda BOTW camera)
  7. **Looking Up** – Character should fade out to allow looking through character with camera at feet of character to give good vision of ceiling without being too close to the ceiling (this will likely require work later)
  8. Looking Down - Camera will zoom out with roughly 15m on all sides. This is go to give good view of the ground for jumping and puzzles. Zelda has good references of this)

- **State modifiers**
  1. **Bow Lowered movement Speed**
     - Full sprint forward is still as fast as normal
  2. **Aiming Bow** – HOLD+LMB, very slow movement speed (70% normal speed)
     - Dashes breaks zoom and zooms you out until you
  3. **Block** – weak as block with bow
  4. Can quickly draw weapons into any other state
  5. **Potion or Items -** Can drink potion with right-hand
     - Can combo into drink potion

Bow/Crossbow, Throwable weapon
(Javelins/knives/Axe/sword)

- **Ranged Stance –** allows zoom to aim and attacks can headshot target
- Required for sniping and long-range projectiles or magic/spells

Press MMB+RMB+"R"

Roll (Dash+Block)
Always Available – uses energy

Block button (LMB)
Always Available

Sprint button (LMB)
Always Available

Magic button (LMB)
Always Available

Main Weapon (LMB)
Always Available

Autocombo (LMB x2-4 times)
Narrow attack window

Long Thrust (Forward + LMB)
Long reach, negative on block
- can pull back or move forward after

Heavy Cleave Autocombo (Hold+LMB)
Wide cleave, slow

Kick (LMB+Offhand)
Armored stab/slash, low damage, uses energy

Armored Thrust (LMB+Block)
Armored stab/slash, low damage, uses energy, 3X=armored multistab, Heavy breaks armor

Flaming Spin Heavy (LMB+Magic)
Uses mana

Lunging Cleave Autocombo (LMB+Sprint)
Hop+cleave (needs space), slow start, if next to enemy, same as autocombo

Lunging cleave (LMB while Dashing)
Same as above, goes bit further if press later

Grapple (LMB+Offhand while Dashing)
Lunging grapple, throw, uses energy

Offhand Weapon (#2)
Quick Attacks,

Autocombo (#2 x2-4 times)
No energy, Shieldpunch, low kicks, hilt attack
- slightly faster than sword
- low damage, positive on block
- does not move forward

Alternate block/chargeup(HOLD+1)
Always Available

Parry (#2+Block)
With shield or hand, no damage on whiff, very short range ping if hit enemy

Holy Shield Bash(#2+Magic)
Powerful parry with shield that knocksback, reflects and armored

Lunging Shield Swipe (#2+Sprint)
Partially armored, low damage, wide area

Shield Slam (#2 while Dashing)
Partially armored, heavy attack with shield, positive on block

Magic/Parry action (R)
Press to Sheath offhand Shield/Weapon
Hold to Sheath both weapons

Sheath Shield to cast Spell
- After spell automatically re-equip shield

Multicast fireball (press 2x)
- Uses mana, slow recovery, can

Cast Consecrate Area(HOLD+R)
Sheath both Shield+Weapon – charge spell, 1+s let go early to cancel
- Improves healing/DPS

Defensive (R+Block)
Cast defensive shield magic

Enhanced Fireball (R+Sprint)
Faster powerful seeking fireball

Piercing Chaos Lance (R while Dashing)
Throws fastest fireball/lance with full throw motion, fast and pierces target

Pillar of flame (LMB+Magic+Sprint)
Uses mana/energy
Slam weapon to cast pillar of flame

Fist of Heavens (Offhand+Magic+Sprint)
Jump to target and slam

Chaos Beam (LMB+Offhand+Magic)
Hold shield up for 0.5s while sheath sword+charging beam, right hand shoots b

Keyboard Console Controls

20200507

Face Buttons

	top	left	right	bottom
Nintendo	X	Y	A	B
Xbox	Y	X	A	B
Sony	Triangle	Square	Circle	X

PJ Console Controls

L1	Parry	R1	Quick Attack (STAB)
L2	Block (Hold)	R2	Main Weapon Attack
		R2 Hold	Heavy Attack

Left Dpad

Up	Activate Hotkey Item/Skill
Righ	Select Right
Left	Select Left
Dow	Hotkey skill Options

Face Buttons

Triangle (Y)	Swap Shield/No Shield, Hold to sheath weapons
Square (X)	Action/Talk, collect loot
Circle (A)	Sprint, Hold+Left Dpad = Dash/dodge
X (B)	Jump/Roll

Left Analogue Stick

Analogue Pad	Move character
Push Down	Toggle Lock

Right Analogue Stick

Analogue Pad	Strafing movement
Push Down	Change Target

Center Buttons

Menu/Select/-	Toggle Menu/Mainscreen
Share/Start/+	Emotes / Party menu

NEW/UNIQUE

RMB+LMB	Kick/blockbreak	Dash Back Attack	DASH+LMB
MMB	Thrust	Dash Sidewats Attac	DASH+LMB
Dash Thrust	Dash+MMB		

KeyBoard Controls (Diablo-style)

WASD - Strafing movement

Q	Turn Left
E	Turn Right
Spacebar	Jump
Shift	Sprint, Hold to dash
CTRL	Action/Talk, Collect Loot
~	Swap Shield/No Shield, sheath weap
C	Hotkeys
B	Bag/Inventory
V	Skills
TAB	Focus lock target at center, Reset
ESC	Menu/Mainscreen

Mouse	Camera Controls
LMB	Function depends Number below

LMB Alternate swap button (press LMB to activate)

1	Main Weapon Attack
2	Quick Offhand Attack
3	Heavy attack
4	BlockBreak
5	Magic/Fireball
6	Ultimate magic
RMB	Block/Parry (Hold to lock camera)
R	Magic/Fireball

Shortcut Hotkeys - press to activate

F	Drink potion
G	Recall Scroll - home

L1+L2 = Burst Aura
L1+R1 = Channelers Magic
O+R2 = EX Parry (deflect/absorb)
O+L1+L2 = Super Magic

O+R2 = Empowered Weapon
O+R1 = Lunging Throw
O+L2 = Empowered Fireball

O+R2 = Punch/Kick
R1+R2 = Heavy Attack

L1+R1 = Heavy Attack

L2 : Magic/Fireball - button
L1 : Block/Focus- hold for alternate skills

O+L1 = Roll

R2 : Quick Offhand Attack
R1 : Main Weapon Attack

Controls

Use Hotkey Skills – In Tabs moves selection
Select Right (goes into menus, moves selection)
Select Left (exits to main screen , moves selection)
Toggle - Scroll Hotkey Skills
 - In Tabs swaps to vertical selection

L1+L2 = Alternate Fireball
O+R1+R2 = Execution Attack

X : Jump On Console (in Inventory=Back/Close)
O : Sprint, Dodge – combine for EX attack
O : Action, (hold) Collect Loot
Sheath/Switch (Weapon/Bow/Shield)
 - In Tabs Uses/Equips item

L : Movement
L : Toggle walk/sneak (Alternate Action button)

R : Camera Movement
R3 : Camera Reset/Lock On

Share : Cycle Max/Min window (quick bag/Tabs)
 - Pad controls change to inventory

Emotes/Party menu

Key O...

Movement

Movement	Keyboard	Mouse
Block/Focus- Hold to lock target	[TAB]	Unbound
Move Forward	W	
Move Back	S	
Move Left	A	
Move Right	D	
Step Dodge, (hold) Sprint	SHIFT	Unbound
Jump	SPACE	Unbound
Lock Camera to Target/direction =	[Capslock]	Unbound
~ = Sheath/Switch weapon		
1, 2, 3, 4, 5, 6, 7, 8, 9, 0, = Hotkeys, Skills items, Potions, Recall		

Choose an Action to assign.

:OK :Back :Unallocate :Return to Default

Right Mouse = Sweeping Attack
Left Mouse = Quick Attack (Hold to Block/Parry)
Center Mouse = Hold to control Camera swivel
Q = Turn Left
E = Turn Right
R/Middle Mouse = Fireball/Magic
F = Action (Hold) to loot
C/B/I = Inventory
Z = Switch Weapon
CTRL = Block/Walk
ESC = Menu
Q = Turn character/camera left
E = Turn character/camera right

Hardcode Shortcuts

7	Mimic
8	Katana knight
9	Shieldknight
10	Skeleton?

T	Ignite sword (katana only)

Stance Controls
- Just examples, our inputs are unreliable right now with limited actual inputs

Offhand Magic (All Skills)
For characters with 1 hand free (including 2 handed weapons)
- Stronger faster magic
- More mobile more offensive

Weapon Mastery Skills

	LMB	Empowered	RMB	Empowered	LMB+RMB	Empowered
Forward	Basic Autocombo	EX Slash - far	Kick/Knee autocombo	EX Armor Slash - far	Leap chop, Lunge crush	EX power chop - long
Neutral	Basic Autocombo	EX slash - near	Punch Autocombo	EX Armor Slash- near	Uppercut	EX Power chop - near
Block	Quick Slash	EX AOE	Long Kick	EX Armor AOE	EX Counter armored slash	EX Armor DP
Block+Forward	Thrust 3	EX Dodge/Jump Attack	Parry	EX Dodge/Jump Attack	Grapple	EX Jump demon grab
Dash	Dash Thrust	Jump Slash	Dash Kick	Jump Kick	Armored Charge – 1hit	Jump Slam
	Jump		Jump		Jump	

Block+Sprint+WASD: Roll
Hold LMB: Fast poke - Advanced users only
Hold RMB: Block
360 Super? Test Super

Offhand Magic Controls- (R or CMB)

Buff Aura Empowered
Block	Negate stomp	EX Absorb
Block+Forward	Step forward Deflect	EX Absorb+ Reflect
Dash	Teleport/	Range 3 slow

Hold CMB: Charged Seeking Fireball (no mana)

QuickSpells Empowered <0.5s Cast-time
	Normal	EX normal
Forward	Normal fireball	EX normal fireball
Neutral	Slowest fireball	EX slowest seeking fireball
Dash	V Fast Fireball – while dash	Fastest Fireball - while dash
Jump	Jump Fireball	Jump Multi Fireball

GreatSpells Empowered >0.5s cast-time
	Split Seeking Fireball	EX AOE
	Split Slow Fireball	EX Nova
	Fast Split Fireball - while dash	EX Teleport AOE
	Jump Split Fireball	Dive strike?

Summons Empowered >2s casttime
	Ranged AOE	Summon Skeleton
	Slowest fireball	Summon Guardian Angel
	V Fast Fireball - while dash	Fastest Fireball - while dash

Ultra Magic CMB+LMG+RMB Armored fast cast
Forward	Ranged Ultra	Defensive Ultra
Neutral	Near Ultra	
Block+Forward	Charging Ultra	Grapple Ultra
Jump	Air Ultra	

Shield+Weapon (All Skills)
For any characters with Shield
- Less ranged attacks
- Lots of short armored attacks
- Same GreatSpells and Summons (no in air attacks)

Shield+Weapon Mastery Skills

	LMB	Empowered	RMB	Empowered	LMB+RMB	Empowered
Forward	Basic Autocombo	EX Slash - far	Shield Punches v2	EX Parry Reflect	Bash+Slash Counter – Slash	EX Throw Sword - far
Neutral	Basic Autocombo	EX slash - near	Shield punches v1	EX Armor AOE	Bash+Slash armored	EX Throw Sword (near)
Block	Quick Slash	EX AOE	Parry Deflect	EX Armor Charge Slash	Spin bash slash – armored	EX DP and Slam AOE
Block+Forward	Thrust 3	EX Armor AOE	Advancing Parry Deflect	EX Armor Charge Slash	Grapple	EX armor errapple
Dash	Dash Thrust	Jump Slash	Dash Kick	Jump Kick	Uninterruptible Charge	Jump Slam
	Jump		Jump		Jump	

Block+Sprint+WASD: Roll
Hold LMB: Fast poke - Advanced users only
Hold RMB: Block
360 Super? Test Super

Offhand Magic Controls- (R or CMB)

Buff Aura Empowered
Block	Negate stomp
Block+Forward	Step Forward Deflect

Hold CMB: Charged Fireball Sword (no mana)

QuickSpells Empowered <0.5s Cast-time
Forward	Enchant sword	EX Step forward enchant sword
Neutral		
Dash	Elemetal Charge Armored	EX Elemental Charge

GreatSpells Empowered >1s cast-time
	Split Seeking Fireball	EX AOE
	Split Slow Fireball	EX Nova
	Fast Split Fireball - while dash	EX Teleport AOE

Summons Empowered >2s casttime
	Ranged AOE	Summon Skeleton
	Slowest fireball	Summon Guardian Angel
	V Fast Fireball - while dash	Fastest Fireball - while dash

Ultra Magic CMB+LMG+RMB Armored fast cast
Forward	Ranged Ultra	Defensive Ultra
Neutral	Near Ultra	
Block+Forward	Charging Ultra	Grapple Ultra