# Carving pumpkins

## General

The idea of “slice a shape into any other shape” was not applicable in my rolling game.

But it still works and it has potential, so let’s make a different game out of it. The most logical conclusion: a fighting game where you *literally* slice your opponents.

**Titles:** Carving Pumpkins and Dwarfing Dumplings

## Main mechanic

When slashing/attacking, you *literally (realistically)* *slice their shape*. They become the “biggest shape”, the other one is simply lost. Once the biggest shape is below a threshold, a player is considered completely dead.

Multiple player configurations (1-6 players max): Team-based, AI-bots

## General rules

* If you’re bigger, you move faster
* A knife thrown from close range, will not slice. If thrown from a bit further, there’s a *probability* it will slice.
* If a knife is thrown from very far away, you get a “long throw” bonus:
  + The knife resets to its original velocity (gaining huge speed)
  + You grow a little
  + And there’s a probability of a second slice through the player.

## Input

Arrow keys / Joystick = Move

Button = Slash

* Quick-press it to slice straight ahead. (The normal across your looking direction, with a small maximum range.)
* Long-press it to throw your knife.
  + This shoots a narrow rectangle, which functions as a bullet, and will keep flying until it reaches a non-player object.
  + There it gets stuck. Touch it to retrieve it again.

Aiming is different between keyboard and controller

* Keyboard has “turn left” and “turn right”. (Because just using arrow keys only allows 8 directions for aiming, which isn’t enough.)
* Controller just follows your joystick.
* In both cases, if you hold it long enough, it slows down. (To get even more precise, but also force you to release quite quickly.)

## Collision Layers

1. All
2. Players. (Though collision exceptions are added manually, at the start, for all team members.)
3. Terrain
4. Powerups (and other (custom) items)
5. Ghosts => used for dead players to interact in *some way* with the environment, and to keep them inside of bounds
6. Areas that want to check if a throwable enters them (even those without a body)
7. Things that are only solid for *players*, but not for *throwables* (or anything else). Only their *mask* is set to 7.

## Groups

* Players => actual, controlled player entities (includes bots)
* Parts => loose player parts; still have a rigid body and value, but can’t be controlled
  + PlayerParts
* Deflectables => knifes get deflected by them
* Stuckables => knifes get stuck in them
* Sliceables => knifes slice through these
* Unpullables => can’t be moved by e.g. a magnet pulling on it
* Powerups
  + PowerupsRevealed
  + PowerupsUnrevealed
* KeepAlives => objects in this group will have their *biggest* body remain (as an active entity), used for Players (as they can be sliced) and the Huge Dumpling
* IgnoreNavs => not counted when generating navigation for Bots (used for things that will move around or can be destroyed+respawned)
* Custom => has a completely custom response to throwable hits
* ThrowableDeleters => deletes a throwable upon hit (if the hit was actually successful/handled)

Remark: adding something to *both* the Stuckables and Sliceables means things are stuck in it *if they go slow*, but slice it *if they go fast*.

# Modes

### Dicey Slicey

Slice your opponents to make them smaller. Too small? Dead.

Last player standing wins.

### Collect ‘em All

Parts sliced off your opponents can be *collected*.

First one to X parts wins.

Remarks:

* Cannot collect your own or teammate’s parts
* Players constantly (automatically) grow bigger to accommodate the size loss through slicing.

### Bullseye

Targets appear across the map. They are divided into sections, giving different points. Throwing from further away *multiplies* the points you get.

Slicing another player gives one of your points to them.

First to X points wins.

Remarks:

* Some targets rotate
* Players start with *more* knives, as they get stuck inside the thing. (Still valid, as now you’re not *physically pushed away* from targets anymore?)

### Frightening Feast

Hitting a dumpling on another player transfers it to you. (There are many different types; some that you might not even *want* to steal.)

First to hold X dumplings (at the same time) wins.

Remarks:

* Ensures at least the basic dumpling is available + place once every 3 powerups.
* Those dumplings you hold *cannot be thrown*. (As they are seen as a collectible in this mode.)
* You can still slice players. Why? If you’re smaller, your dumplings are less spread out, increasing the chance of someone hitting them.
* (Still though, might need a better ruling for this.)

### Dwarfing Dumplings

Each team gets their own *huge dumpling* to protect. (Max 3 teams.)

If it’s completely sliced, you lose.

Remarks:

* Players start smaller
* When you slice the huge dumpling of an opponent, you are blasted back. (To prevent easy repeat slices.)
* When you die, you respawn back (after a few seconds) at your home base. (In the meantime, you’re a ghost.)

### Ropeless race (TO DO)

Each player receives *lives* attached to them via ropes. If another player slices through such a rope, it comes loose and you lose that life. No lives? Dead.

Last player standing wins.

Remarks:

### Capture the flag (TO DO)

One player from each team has a *flag* inside of them. (Max 3 teams.)

This is hidden information. (The player having the flag cannot throw knives, that’s how they know.)

If the flagbearer is sliced through, you obtain the flag. First to X captures wins.

Remarks:

* Throwing a throwable at a teammate (and them grabbing it), causes the flag to *switch places*??
* You still need to bring the flag *back home??*

# Powerups

Powerups are shown as “packages”. You need to *slice them open* to see what’s inside. (You can also grab them the normal way, but then you don’t know what you get.)

As always, they are grouped by *category*, where each category follows the exact same color scheme.

### Shape

* **Grow**
* **Shrink**
* **Morph** => reset to a *different* shape (from predefined list)
* **Ghost (temporary)** => you are temporarily unslicable
* **Hungry (temporary)** => walking over pieces makes you *eat* them (to grow yourself)

### Knife/Slashing

* Lose knife
* Faster throw speed
* Slower throw speed
* Knife Repel
* **Repeater =>** Throw *all* your knifes at the same time. **=> TO DO**
* **Destroyer =>** Anything thrown at you is simply destroyed on impact

### Moving

* Faster move
* Slower move
* Reversed controls (temporary)
* Ice (temporary)

### Collecting

* Magnet (temporary) => you *attract* stuff to yourself
* Duplicator (temporary) => any dumplings you eat/parts you collect are *duplicated*
* Clueless (temporary) => you can’t collect anything
* Auto Unwrap (temporary) => automatically unwrap powerups when walking over them

### Misc (perhaps *too* wild)

* **Switch teams!** (Randomly. Can’t really show all colors on such a thing.)
* **Vampire** =>
  + The game has light/dark. Vampires can’t enter the light?
  + A vampire can only slice you from *close range*, but does *more damage* if so. (As they “drink your blood”.)

# Arenas

### Ghost Town (Implemented)

* Mostly open grass field, with a few bits of rubble and leftover stone walls
* Switches between day and night.
  + At night, one player becomes a ghost.
  + And two big “ghost knives” appear.
* Meant as a light training ground,so mostly open and free, no complex stuff.
* **Fun slicy stuff?** Some barrels.
* **Removing throwables?** Happens when you throw one into the cave
* **Dead players?** Can control the Ghost Knives.

### Spooky Forest (Implemented)

* Some trees deflect, others get your knife stuck.
* Some trees can be *cut down* by throwing a knife. (Though if too slow, it just gets stuck. And if successful, the throwable is removed.)
* It has a layer “above” the players, so you’re actually walking underneath branches.
* A *mist* travels through the map regularly. Anything thrown into it is deflected randomly (changing its path slightly)
* **Fun slicy stuff?** Sliceable trunks.
* **Removing throwables?** Happens by throwing them into the “sliceable” trunks
* **Dead Players**? Get a mist around them as well.

### Graveyard (Implemented)

* Tombstones to hide behind (which might move)
* A light that constantly moves
* Some flowers/variation around the graves.
* **Fun slicy stuff?** Some stones near the edges of paths, all of them modular and sliceable.
* **Removing throwables?** The gates open (alternating pattern). Anything thrown into the open gate (“out of the field”) is destroyed.
* **Dead players?** Become a tiny tombstone, capable of moving around (very slowly), and any knives in them can be thrown again.

### Dark Jungle (Implemented)

* Small areas separated by thick patches of leaves: these constantly regrow, up to a limit
* Some solid things inside as well, to prevent knives from slicing through *absolutely everything* at once.
* Firefliesfor nice lighting. Hitting one turns off its light (temporarily)
* The spiral-icon places teleport both *players* and *throwables* to their counterpart (diagonally, other side).
* **Fun slicy stuff?** The vines.
* **Removing Throwables?** *Doesn’t happen*, as you really need them to slice your way through the jungle.
* **Dead players?** Become a firefly.

### Bogus Blackouts (Implemented)

* Divided into rooms
* Throw something against the light switch to completely turn off the lights. (This also happens randomly.)
* Stairs to teleport from one corner to the other
* Windows can be broken when throwing a knife through them.
* **Fun slicy stuff?** The windows.
* **Removing throwables**? Happens by throwing them out the window. (There’s one window going “to the outside”.)
* **Dead Players**? Can activate light switches, if *multiple* are on the same one.

### Swimming Pool (Implemented)

* A simple swimming pool. (When you walk through water, ripples appear around you.)
* Maybe several pools, of different sizes, with a small walkway between and a jumping plank/glide.
* Moving in the water is much *slower*, or just *different*? (A bit like the ice movement in Totems of Tag. Or *aiming* is constant, meaning you just keep rotating and rotating until you release.) => Yes, both aiming and movement are different and wobbly.
* Also, *entering* water goes with a splash/bang? (It sends shockwaves and literally blows away things/people around the point.)
* **Fun slicy stuff?** There are those “blow-up boats” (and crocodiles, and helper things, etc.) floating in the water? => might not even all be throwable, getting stuck in something like this + it floats is also fun
* **Removing throwables?** There’s a *drain* somewhere that attracts throwables (and stuff in general?)
* **Dead players?** Can vote (by hovering over buttons) to change the wave direction.

### Family Dinner (Implemented)

* A family member sitting in the room. Any time a knife gets stuck in them, they become more *angry*. Once the meter is filled, they explode in FURY and shoot away all the knives.
* Otherwise just a big table, with chairs, and lots of food that can be sliced.
* **Fun slicy stuff?** All the food and plates on the table.
* **Removing throwables?** The “angry” person doesn’t give back *all* the knives put into it? (In any case, keeping the knives for some time is already a form of “removing” them.)
* **Dead players?** Can eat the many leftover food parts. If they do that enough (10+?), they are revived, albeit with a smaller body. If that’s too strong, just give them *some* of their functionality back.

### Pirate Curse (Nearly implemented)

* An island with some water around it. (Using all the water mechanics/rules also used in the swimming pool.)
* Treasures appear. Hit them to:
  + **Heart:** revive the last player that died (though smaller/less powerful)
  + **Destroy**: destroys whatever was thrown against it
  + **SelfSlice**: your body is randomly sliced
  + **Curse:** your controls are reversed + you get some random penalties to speed/movement/throw speed/number of throwables
  + **Free Point:** Get a free point (in a mode where collectibles are a thing). If you can die in this mode, you *grow*.
  + **BigCurse:** *all* players are teleported to a random different location and might receive a random curse.
* **Fun slicy stuff?** The treasures lying around. (Plus some leaves or stones?)
* **Removing throwables?** There’s a treasure for that.
* **Dead players?** There’s a treasure for that.

### Haunted House

* The whole *stage* changes every X seconds => there’s a flash, fade out, all obstacles inside are removed (if needed), then we come back to the new arena
* Lots of creepy things *doing things on its own* => mostly has to do with *traps*
  + **Trap 1:** a wall that shoots knives sometimes. These have a *random owner*, which might be you (in which case you grab it) or not.
  + **Trap 2**: a floor that gets *holes* in them from time to time
  + **Trap 3**: boulders rolling/flying at you => can be sliced to prevent your demise.
  + **Trap 4**: just a lot of furniture moving around => there are *mirrors*, some are fake and will break on contact, others reflect the knife back *but with a different owner* ( = slicing yourself)
    - This idea is actually so nice it might be an arena in and of itself?
* **Fun slicy stuff?** ??
* **Removing Throwables?** Happens on certain stages.
* **Dead players?** The icons for the other arenas are in the corners. Dead players can vote for the next trap (when it switches).

### Cheese Factory

* Akin to a storage room/factory mix.
* Conveyor belts are everywhere.
  + Lots of cheese blocks (or butter, or whatever) appearing on it. (Also in fixed stacks on the field.)
  + Players are also influenced by them
* *Throw* the cheese to freeze people in place?
* *Throw* the butter to blow them back and make movement skippy slidy? (But after one throw, they disappear.)
* Add a **slicing machine** somewhere, which eats players and throwables alike.
* (Add those doors that swing open/closed?)
* **Fun slicy stuff?** all the cheese and butter
* **Removing throwables?** Throw them into the slicing machine.
* **Dead players?** Can reverse the direction of conveyor belts, once in a while.

### Bat Cave

A dark (grey/black) cave full of bats. Get inspired by the Batman visuals and ideas.

### WeB o’ Spiders

A big spiderweb. Ideas:

* You can only move over the actual lines.
* (Knifes only move over those lines as well?)
* Big, scary spiders move around as well. They block your path + eat/slowdown any knives thrown into them?

## Workflow for Each arena

**Step 1:** Draw it in Affinity Designer, keeping in mind separate layers/groups

**Step 2:** Designate zones for *collector UI* and *huge dumplings*

**Step 3:** Import to Godot. (Place correct sprites, in correct map layer, at correct position.)

**Step 4:** Create static bodies where needed. Put these in **Collision layer 1 and 3.**

**Step 5:** Add lights, canvas modulate, and light occluders where needed.

**Step 6:** Finetune, add custom logic, make some things stuckable or deflectable or sliceable.

# Throwables

### Knives

* **Knife =>** slices stuff, has an owner (which it loses when no velocity), no body
* **Boomerang** => after one hit, finds a (smooth) path back to owner
* **Curve** => simply curves a lot (a bit random, not sure if too great)

### Dumplings

* **Dumpling** => deflects knives, in-air and when on your body
* **Poisoned Dumpling** => when hit by someone, the attacker is poisoned: they lose one throwable and get their controls inverted.
* **Double Dumpling** => worth two points (in modes where dumplings are collected), makes you bigger
* **Downgrade Dumpling** => worth *minus points* (in modes where dumplings are collected), makes you smaller.
* **Timebomb Dumpling** => will automatically throw itself after X seconds

**Remark:** the effects of dumplings are also, by default, “on hit”. Because dumplings are friendly and grabbed by anyone. So a hit just means they grab the dumpling and get the effect.

### Misc

* **A Melee Weapon.** Something that only works close range, but is *very effective* there. Probably an “area” effect that hits everything within a certain radius, no matter how you aim.
* **Thor’s Hammer** => when hits body, slices you 1-3 times in random ways => when you hold the throw button, all hammers come flying back to you?
* **Bat** => chases the nearest player, simply shrinks you?
* **Spider** => pushes *players* aside, as they don’t want to come near the spider or touch it, but it does move incredibly slowly. (Or it copies your movement after being thrown??)
* **Borderline** => there’s a knife that draws a line behind itself. That line will persist for X seconds. Anyone that crosses it is sliced?
* **Grappling Hook:** A knife that works as a grappling hook: throw it, whenever it does something, *you* are attracted to its current position.

They can have these properties:

* Owner: *Auto, Friendly, Hostile*.
  + Auto = default behavior. Starts with an owner. Once stuck or standstill, it loses its owner.
  + Friendly = has no owner; anyone grabs it when nearby, can’t hurt players
  + Hostile = has no owner; nobody can grab it, everyone is hurt
* Body: *False, True*
  + If false, no *actual* CollisionShape is created, and everything goes via RayCasts. Needed for objects that *slice* things.
  + If true, a KinematicBody and CollisionShape are added and used for movement instead

# To Do

## Update (overview)

* Improve bots:
  + Better move around obstacles
  + Add personality (including delay between button presses)
  + Fix the obvious bugs
* Fix all the minor bugs/improvements in “minor to-dos”
* Add the planned arenas.
* Add the “Ropeless Race” and “Capture the Flag” modes, if I can find something good and easy for them.
* Add the extra throwables.
  + At least something for *close range* and *losing throwables again*. And something really uniquely Halloween, unique to this game’s mechanics.
* Provide a free demo => 2 arenas, 2 modes, 4 powerups/collectibles
* Create Trailer + add pumpkin emojis to page
* Add to pandaqi.com + finish devlog
* (Re-use the IM Fell English set of fonts for the other slicing games as well? Or just other games. They are really cool!)

## Better bots

* Somehow, I should be able to “grow” their path, or more intelligently avoid obstacles.
  + Perhaps I should just check the *get\_slide\_count*, loop through it, move away from anything we hit?
  + **Better idea:** add a circular area around the player. Only consider bodies with dot product >= 0 with our movement vector. Move away from them.
    - Because it’s a top-down game, this might be way more powerful/logical than using raycasts.
    - **How to calculate the radius?** Just take the max of Y bounds or X bounds, plus quite some margin.
    - **Weight bodies based on distance?** (So we only smoothly go around if we’re away, but an obstacle we literally bump into should have weight 100%?)
* Bots can “insta-press” buttons. Add *some* delay between press/release cycles to make it more manageable?
* Don’t get *too close* to the target (if it’s a player), now that this is punished)
* Weight the vectors more based on their *distance* to the player (and thus their urgency/relevance)
* Fleeing from knives pointed at them is broken? Never really tested it, though.
* Failsafes
  + Create a generail fail-safe against flipflopping. (Check vector over X subsequent frames. If the average “dot product” between them is too low, we’re flip-flopping, so go to the “unstuck”-phase again.)
* Niceties:
  + Give personality.
  + If no knives, *and* no knives for grabs, flee from others?
  + Add the general niceties.

## Minor To-Dos and Questions

* Pirate Curse => add some torches (probably in the stones) for lighting? (Would require particles and animated sprite, otherwise it just doesn’t look good.)
* Family Dinner => occlusions also on objects themselves (make them their own sprite to ignore that), food uses the “multicolor” coloring … which doesn’t look good at all.
* Cartoony style => fully implement => smooth outlines when needed, turn it on/off where needed, make it look good.
* Make collectors look better. Also allow placing them in *any* map layer. (Sometimes they should overlay, sometimes they should be ground.)
* All extra rules are untested …
* Sometimes, when knives get stuck in something they still rotate the wrong way around? (It seems their raycast hits the *back* of the object, instead of the *front*. Which suggests the raycast starts *inside* the object because it’s too fast?)
* When possible, permanently show the effects of a powerup (in a unique, clear way, like a “magnet” shape or particle effect for the magnet)
* **Auto-**throwing: automatically use quick-slash when something is near
* Menus: Create Human/Bot version for all player colors, pick correct one.

### Really, really optional

* Swimming pool:
  + Make floating objects a bit *heavier* to reduce chance of them absolutely jumping around
  + Make light distribution nicer (symmetric?) => in general, find ways to make it look slightly better
  + Explain the “drain” with some extra particles and stuff?
* Dumplings: give different types a different *trail*?
  + Isn’t it confusing that dumplings have their own color *which has nothing to do with player owner*, while other throwables *have a color that shows owner*?
* ~~Button for~~ *~~changing bot teams~~* ~~(if they ever learn about teams).~~
  + **Don’t see a good solution in current system.** For next game, allow player to *traverse* all logged-in players/bots (with arrow keys/joystick). So we can edit each player specifically by going to them.
* **IDEA:** Different *ground terrains*. As long as you’re on that terrain, you are influenced by its special effect (whatever it is).
  + Icy movement, sticky movement, keep growing/shrinking?
  + Curver => curves any throwables through it. (Might be more intuitive to make it a “magnet” or “hurricane” or something.
* **IDEA:** A way to really *separate* a map between players, locking them into a certain zone
  + **AMAZING (but weird) IDEA:** There’s an actual *minimap* of the arena available somewhere. Slicing it will *actually* divide the arena into those portions.
  + **Maybe something for a different game. =>** would be cool though, maybe for a pirate game about slicing the actual map, or a puzzle game.

**Things that are probably already fixed:**

* Make dumplings *also* deflect knives in the air. (That’s the whole reason I gave them a *body*.) => I think they already do this by default! (Their body is never actually reset, which makes all their functionality possible.)
* On old playtest, there was an issue with owner not being reset on knives standing still. I think it had to do with max capacity, and I fixed that clear bug, but not sure if that solved all issues.
* On old playtest, some losers (or winners?) didn’t get an award handed to them at the end. Is that fixed?