

UC Riverside

UCR Honors Capstones 2019-2020

Title

PolyGone: A 2D Adventure

Permalink

<https://escholarship.org/uc/item/0fw7x85f>

Author

Cao, Amanda

Publication Date

2020-04-01

Data Availability

The data associated with this publication are within the manuscript.

By

A capstone project submitted for
Graduation with University Honors

University Honors
University of California, Riverside

APPROVED

Dr.
Department of

Dr. Richard Cardullo, Howard H Hays Jr. Chair, University Honors

Abstract

Table of Contents

Meet the Main Character	2
Level 1: Land of the Triangles	3
The Inspirations of PolyGone: The Art	6
The Inspirations of PolyGone: The Game Mechanics	12
The Makings of PolyGone	14
Final Thoughts	15
References	17

Meet the Main Character

PolyGone follows the story of a young circle boy named Kepper who is the lone survivor of the circle tribe. Kepper awoke alone in a foreign land with nothing but his family circlet. He has no idea how he wound up there, but he knows that he certainly is not welcome. The only thing he can do is move forward and find out what happened to his people.

At the start of the game, he has no special abilities other than being able to fight enemies in close-range with his bare hands. Kepper is outranged by most enemies in his path, so he must be quick on his feet in order to stay alive.

However, once Kepper defeats the first boss of the game, something mysterious happens! An orb from Kepper's circlet begins to glow and shroud Kepper in a red light. Kepper finds himself dawned in the boss's likeness and the orb now has a triangle engraved in it. Kepper is now able to drill through whatever may block his path, even through rock!



Kepper's original form (left) and triangle form (right).

Level 1: The Land of Triangles

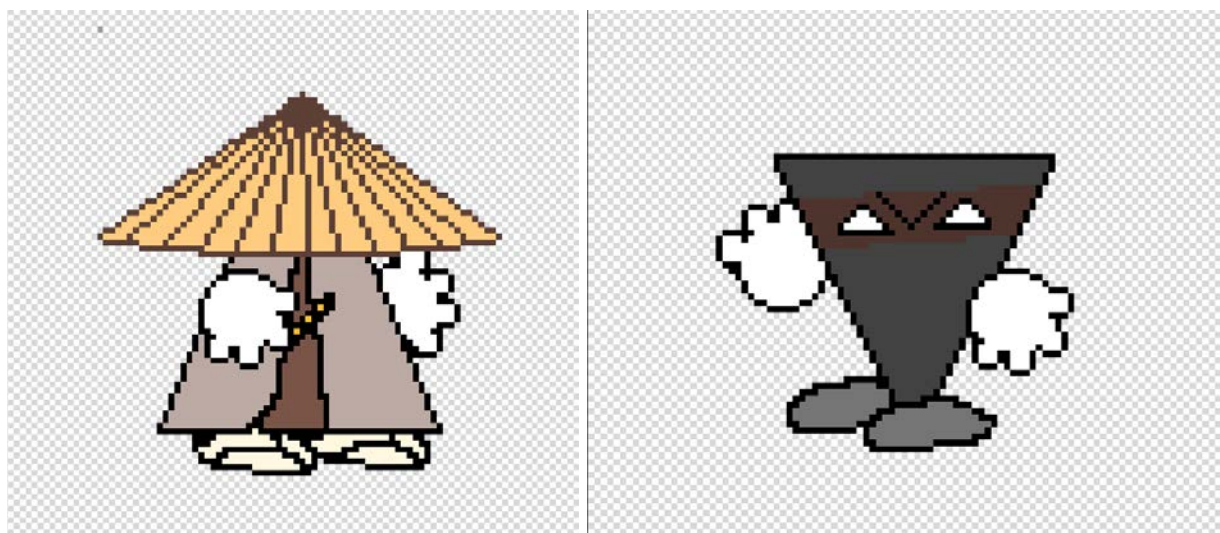
The game begins with Kepper in a foreign land full of people he's never seen before! Unlike him, they have 3 sides and a bad attitude. Within the first moments of the game, Kepper is met with an onslaught of shuriken he must dodge to stay out of harm. He doesn't know where to go but he can trust the one thing that reminds him of his fellow circles: coins!



The beginning area of level 1. There is a path going up and down for the player to explore.

As Kepper follows the coins throughout the level, he must do something about the aggressive locals. He can either try to avoid the enemies or fight back with his slap attack. One of the types of enemies Kepper encounters are ninja mercenaries hired by the shoguns of this

land. They'll mercilessly throw barrages of shuriken at him, yet they don't care whether he dies or not. As long as he dodges their attacks Kepper can pass by them just fine. However, the samurai are loyal servants of the shoguns and will pursue him on sight. Kepper must be very quick to run away or beat them in a fight.

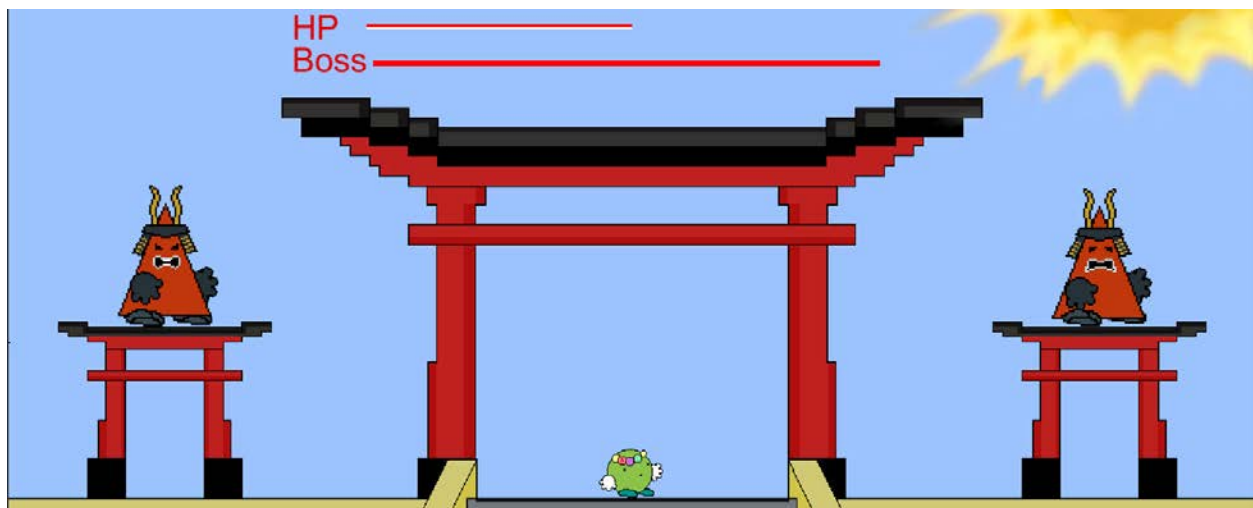


Sprites of samurai (left) and ninja (right) enemies.



Area leading to the boss of level 1.

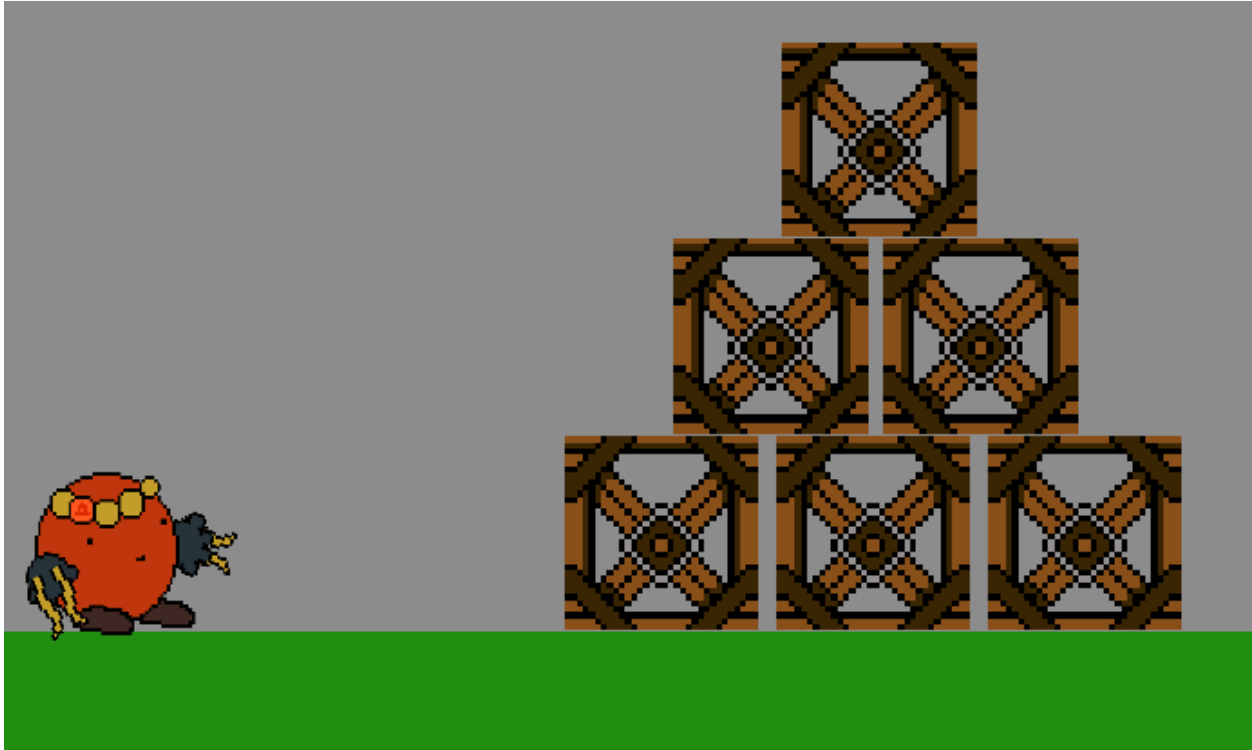
The coins will eventually lead Kepper to a mysterious gate that will lead him to the bosses of level 1, the ruling shoguns. During the boss battle, Kepper must continue to weaken the bosses and survive through three phases of the bosses' wrath. The first phase involves the two shoguns leaping into the air and landing with a crushing force. The angry shogun will pursue Kepper in his rage while the sad shogun will randomly jump in anguish. Eventually, the bosses will tire and that will be Kepper's opportunity to strike! In the next phase, the two shoguns become spinning torpedoes in the air, ramming their sharp helmets toward Kepper. Once again, the angry shogun zooms toward Kepper while the sad shogun seems to spin across the room at random. After spinning too many times, the bosses will get dizzy and Kepper can once again strike down on his vulnerable foes. Finally, in the last phase, both shoguns rally together and dart across the room in a coordinated manner. Kepper must be careful to dodge both of them until they accidentally ram into each other. Once they are stunned Kepper can finish them off once and for all.



Kepper spawns into the boss room with the two shogun bosses standing atop the crimson gates.

After the two shoguns are defeated, Kepper obtains their power and gets teleported to what would normally be the next land of shapes where the rectangles reside. However, since the

production never proceeded past the triangle level, Kepper instead gets transported to a test room where he can test his new drill power on some breakable crates. This test room marks the end of our demo and the player may quit at any time.



Kepper spawns into a test room where he can test out his newly found triangle powers.

The Inspirations of PolyGone: The Art

My inspiration for the character design of PolyGone was originally driven by the indie game *Thomas Was Alone* by Mike Bithell. *Thomas Was Alone* is a 2D Platformer where the characters are simply varying quadrilateral shapes. The goal of the game is to reach the end of every level by utilizing each character's unique abilities. The character designs of the characters have an interesting connection to the corresponding game mechanics that come into play.



The cast of Thomas Was Alone. From left to right, top to bottom: Claire, James, Laura, Sarah, Chris, Thomas, John.

While Thomas is the standard for what is considered a “normal ability” in terms of size and mobility, all the other characters communicate their ability through their design differences with Thomas. Claire has the ability to float in water, and she is a large square to symbolize her buoyancy. Laura allows the other character to bounce off of her for a jump boost, and she is a long horizontal rectangle that resembles a trampoline. Conversely, John is a tall vertical rectangle who has the highest jump out of all the characters. James’ only difference from Thomas is that his color, green, is complementary to Thomas’, red. This could explain why James’ gravity is reversed and is able to traverse the ceilings of the levels. Sarah is a small rectangle and I believe the common correlation between small creatures and nimbleness is related to her ability to double jump. Finally, Chris is a small square whose ability is to fit into

small places speaks for itself. I love how much so little can communicate in the character designs of *Thomas Was Alone*. This inspired me to explore more ways to tell a story in a video game using basic shapes in my character design.

The next immediate inspiration that came to mind for designing my characters was the famous *Kirby* series by HAL Laboratory. The intro to *Kirby's Adventure* has a cutscene about how to draw the game's protagonist: "First you add a circle, then you dot the eyes. Add a great big smile and presto, it's Kirby!" Kirby's design is extremely simple yet there is a lot to unpack in his design. In a [video](#) commentating about Kirby's character design, Brookes Eggleston says, "There's a lot being communicated by his design. By using exclusively round shape language, we intuit that this character is caring, childlike, harmless, and perhaps more importantly filled with potential." Additionally, Brian David Gilbert gives that point to an interesting spin in his [video](#) by questioning the contradicting simplicity and unlimited power Kirby seems to possess. I wanted to portray that same duality in our protagonist, Kepper.



And presto, it's Kirby!



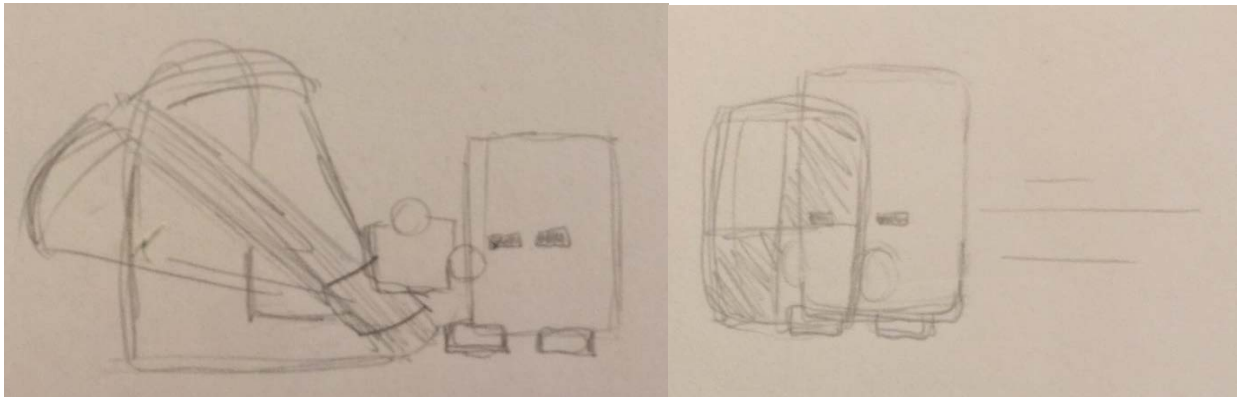
Kirby from Kirby's Adventure (left) and concept art of Kepper from PolyGone (right).

When my team and I came up with Kepper and the type of story he'd have, we considered the common disbelief that circles have no sides but in reality, circles have infinite sides. That's when Kepper's circlet came to be. We decided on a narrative where Kepper slowly "gains more sides" by obtaining the powers of all the other polygons and thus "completing the circle".

Designing the main character aside, I especially wanted to communicate the lore of the game through the character design of the enemies. In order to do that, I had to somehow portray an entire nation as a single shape. I wanted to keep the integrity of the shape as much as possible in the designs. I looked at the character designs of a video game company named The Behemoth for inspiration. They are well-known for their simple yet charming character designs, relying mostly on basic shapes. One of their games, *Castle Crashers*, features boxy knights that go on adventures to save damsels in distress. When I drew the concept art of the rectangular enemies, I decided to take the helmets from the game and attempted to "Kirbify" them. "First you add a rectangle, then you square the eyes. Add a great big shield and presto, it's an enemy!" *Castle Crashers'* character design was a big inspiration for my rectangular medieval soldiers that unfortunately didn't make the final demo of the 10-week period I worked on the game.

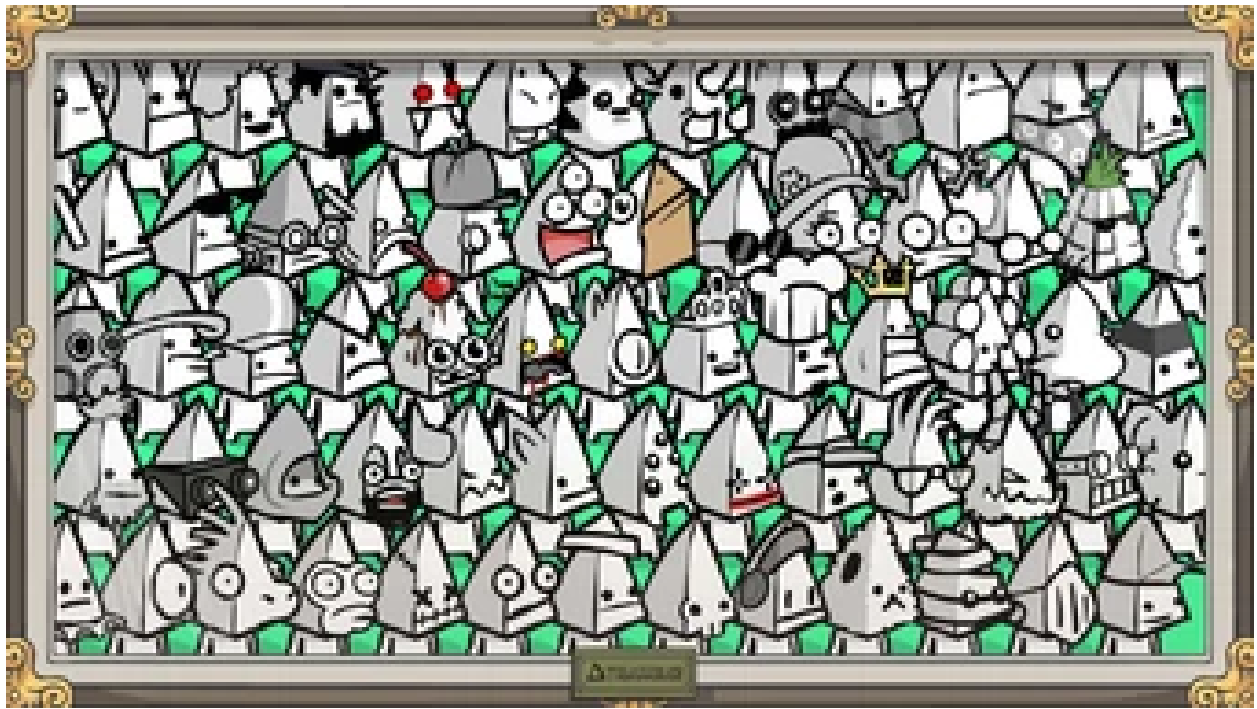


Main characters of Castle Crashers.

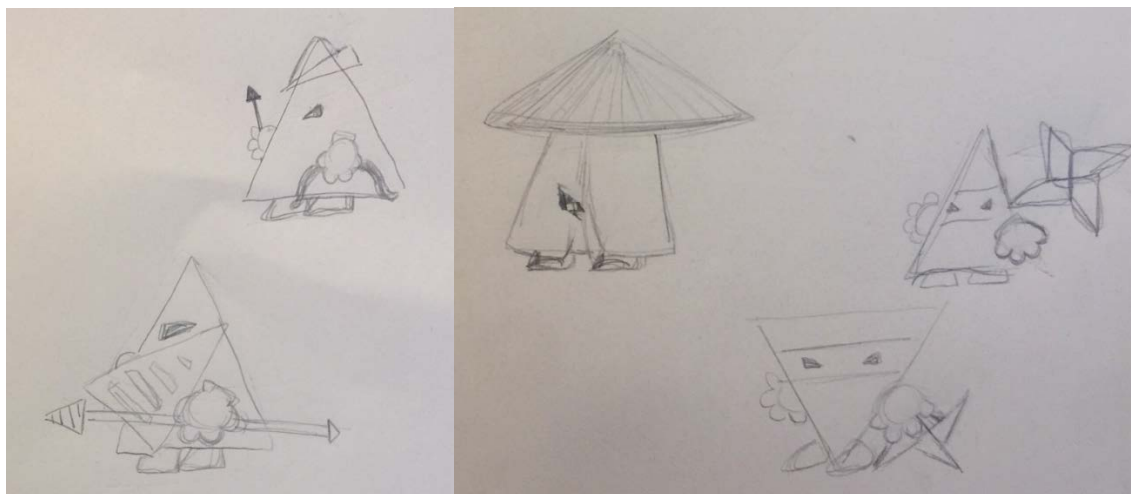


Concept art for quadrilateral enemies.

Another title from The Behemoth that helped me in my character designs is *BattleBlock Theater*. In the game, you can unlock different “heads” of varying shapes to customize your character. Each one has exaggerated features that complement the shape of the head, adding so much character to what would’ve been a plain polyhedron. I loosely referenced the triangle-shaped heads when coming up with ideas for the triangle nation.



Collection of triangle-shaped heads available in BattleBlock Theater.



Concept art of triangular enemies.

If you look at my concept art of the triangle enemies above, I tried creating characterizing features out of even more triangles to emphasize the shape motif. On the left, you can see my concept art for an archer and a spearman as triangles. I tried to draw the archer's hat and spearman's jousting helm primarily with triangles. On the right, I took a less obvious approach in implementing triangles into my concept art. Instead of adding triangular accessories, I tried

focusing on making the silhouettes look like triangles. In the end, the feudal Japan aesthetics won my team over and thus the art chapter came to a close.

The Inspirations of PolyGone: The Game Mechanics

Game mechanics is a quality that can make or break a 2D Platformer. If the movements aren't smooth or if the levels aren't fun, there isn't much reason to play the game. I wanted PolyGone to be a fun platformer accessible to players of all skill levels while still providing an engaging gameplay experience. To achieve this, I looked at my favorite platformers for guidance.

The game's accessibility to all players despite their experience with video games was very important to me. That's why the first game series I looked to was, again, the *Kirby* series. *Kirby* games are known to not be very challenging yet they still attract players of all ages. That is because of the many abilities Kirby has at his disposal. Kirby is able to consume his enemies and copy their abilities. Each of his abilities give a unique visual and gameplay experience. To take advantage of Kirby's various abilities, the game is more focused on fighting a ton of enemies than skillfully parkouring through a level. The only downside to creating a *Kirby*-inspired game, is that it's not feasible to design and implement a lot of abilities in the span of 10 weeks. I needed to find a middle ground between an easy platformer with a lot of fun mechanics and a challenging platformer with a limited toolkit.



The many abilities Kirby can use, each with their own character design.

Another game series that uses abilities to make gameplay interesting is the *Shantae* series. Shantae is a half-genie who has the ability to transform into different creatures. While these different forms give her advantage in combat, it also adds new options for mobility. Unlike Kirby who has to obtain powers from his surroundings each level, Shantae gains her powers over the course of the game to use on demand during a level. This requires the player to think critically about the powers they use in order to progress through the level. It also adds a layer of difficulty without requiring technical platforming skills that may be harder to acquire. The concept of acquiring different forms as you progress through the game was adopted into PolyGone's mechanics in the form of Kepper's shape powers that he obtains after defeating bosses.



The different forms Shantae can take in Shantae and the Pirate's Curse

The Makings of PolyGone

The PolyGone team consists of 5 people. I am the lead character designer and a script programmer. I am in charge of deciding how the characters looked and behaved in the game. This often required me to program scripts for the characters' behaviors in the game. Dominic Renales is the lead music director and general assets designer. He wrote all the music as well as designed most of the level assets used in our game. Cody Khuu is the lead programmer who was responsible for programming most of the game mechanics. Jason Mendoza is another script programmer and a general assets designer. He helped Cody and I program some of the scripts for

character movements as well as the combat. Finally, we have Zifei Wu as our lead UI designer. He was responsible for all the menus and general UI on the game screen. We all had our unique skill sets and special roles to play in this project.

Over the course of the quarter, our operations were organized using what's called the Scrum framework. Scrum is a form of Agile development where each week a team decides on a deliverable that can be presented by the end of the week. Then, they divide the work into small tasks to distribute amongst the team members. Every day of that week the team will have a daily meeting where the team shares the current progress, obstacles, and plans for completing the deliverable by the end of the week. This framework focuses on incrementally developing a minimum viable product that eventually manifests into the final product.

We used a variety of tools to make our game. We used BeatBox to compose game's soundtrack, GIMP to design the game assets that make up the look of the level, and pixil.com to design our character sprites. However, the tool we used the most was the Unity game engine. There are three main tools we used in Unity to make our game. If we had to do work relating to the levels, we worked in the scene editor. If we had to work with Unity's sprite editor and animation editors. Finally, if we wanted to program a script for any behavior in the game, we used the Visual Studio code editor.

Final Thoughts

I am very proud of the accomplishments my team have made. We implemented a solid 2D platformer with a complete level and boss battle all while making 100% of our assets. I am also happy with the character designs I came up with. Seeing their sprites come to life in-game with the animations I made was really satisfying.

I found that the scrum method was very useful in developing our game. Creating all the tasks we planned to implement helped us visualize and connect small tasks with the big picture. Additionally, the daily status meetings and weekly planning meetings helped keep everyone accountable for their tasks.

If I were to take note of any obstacles during our journey, it would be how hard it was to schedule everything in the midst of how busy everyone was throughout the quarter. Most times, obstacles that were brought up in meetings were that people simply became overbooked for the week to complete all the tasks they planned that week. However, through persistent “graveyard shifts” we were able to finish a project we were proud of.

Install the game now:

<https://drive.google.com/file/d/1HsZ0bQM2ZGw19GpbpHxbWErHPwwEtAe4/view?usp=sharing>

1. Unzip folder
2. Poly_Gone->Installer->Poly Gone Installer
3. Follow instructions to install the game!

References

BattleBlock Theater Triangle Heads. Digital image. *Fandom*.

https://vignette.wikia.nocookie.net/steamtradingcards/images/b/bb/BattleBlock_Theater_Artwork_04.jpg/revision/latest?cb=20140518040337

Castle Crashers Characters. Digital image. *Trusted Reviews*.

<https://ksassets.timeincuk.net/wp/uploads/sites/54/2015/09/image-5382-1.jpg>

Kirby's Adventure. HAL Laboratory, 1993

Kirby's Adventure Opening. Digital image. *Giant Bomb*.

<https://giantbomb1.cbsistatic.com/uploads/original/7/70884/1472914-kirby.png>

Kirby's Forms. Digital image. *Fanpop*.

<http://images6.fanpop.com/image/photos/34200000/Kirby-s-copy-abilities-1phantomrfan-34278446-574-576.png>

Kirby: Triple Deluxe. HAL Laboratory, 2014

Eggleston, Brookes. "What Can We Learn From Kirby's Character Design?" *YouTube*,

2 Jan. 2019, <https://youtu.be/2HGmj9DvkPk>

Gilbert, Brian David. "Kirby | Unraveled" *YouTube*,

2 Mar, 2020, <https://youtu.be/Udk8YHOy0EU>

Shantae's Forms. Digital image. *Know Your Meme*. 18 Aug. 2014,

<https://i.kym-cdn.com/photos/images/newsfeed/000/813/128/784.jpg>

Shantae and the Pirate's Curse. WayForward, 2014

Thomas Was Alone. Mike Bithell, 2012

Thomas Was Alone Cover. Digital image. *TV Tropes*.

https://mediaproxy.tvtropes.org/width/350/https://static.tvtropes.org/pmwiki/pub/images/tomas_was_alone_cabecera.jpg