

En's Adventure:
Exploring Modern Design Mechanics in Retro Adventure Games

by

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Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts in Game Design
at
Lindenwood University

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ADVENTURE GAME

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By

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ABSTRACT

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This project focuses creating a small game prototype that can be used to build a full game around. The primary focus is to create a short experience to establish the mechanics and gameplay of the game. Games made in the style of retro games are released every year, but most of these games strive to provide the same experience from the late 1980s. The project is a top down 2D retro adventure game made using modern techniques and learning from game development in the 30 years since these games were released.

Keywords: level design, retro game, adventure game, role playing game, game mechanics

Acknowledgments

Games are never the work of one person, as even the tools used and the computer it was made on are the work of thousands of people. I would like to thank my committee members, Professor Ratican, Professor Fulcher and Professor Hutson. I would also like to thank teachers from previous institutions who taught me about game design and programming.

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Introduction

The project originated by playing Nintendo games from the late 1980s and early 1990s, especially *The Legend of Zelda* (1986-) series. Even though most games today are made in 3D and no longer top down, the retro games of the late 1980s and early 1990s pioneered the gaming industry and were not afraid to take risks exploring new ideas or gameplay concepts. *The Legend of Zelda* set a standard for the action adventure genre, which has it continued to push forward with every iteration. This project aims to create a 2D top-down action adventure game in the style of a retro *Legend of Zelda* game.

The project is a top down 2D adventure game inspired by *The Legend of Zelda* (see Figure 1) and *Final Fantasy Adventure* (1990) games. The project features traditional adventure game mechanics such as melee combat, puzzle solving, exploring dungeons, and finding new items. The game takes place in Okinawa, Japan during the 1600s, which in the period was known as the Ryukuu Kingdom (pref.okinawa.jp, 2013). Games such as *Sekiro: Shadows Die Twice* (2019), *Nioh* (2017-2020) and *Ghost of Tsushima* (2020) take place in Japan, Okinawa is not often used, and many people do not know it has a different culture, language and identity to mainland Japan (pref.okinawa.jp, 2013).

One of the inspirations for this project, *Final Fantasy Adventure* is a top-down adventure game for the *Game Boy* (1989-2015), and at first glance, *Final Fantasy Adventure* (see Figure 2) looks like a copy of *Zelda*, but upon further inspection, *Final Fantasy Adventure* has several elements that set it apart. The game is closer to a role-playing game than it is to a adventure game. The game features a leveling system, which allows players to increase their attack, health points, stamina, and defense. The game also does not include inventories for consumable attack

items; all attacks consume stamina, and when the player is out of stamina, waits to recharge. The game also features a spell system and one-time use items.

Role playing games generally have a complex story with lots of character development and sees the character setting off on an adventure all over the world (Schuller, 2017). Rogers (2008) describes adventure games as “adventure games focus on puzzle solving, and item collection and inventory management”. Japanese role playing games, commonly referred to as JRPG, focus on turn based combat (see Figure 3), where each player takes a turn and the other players perform no actions until their turn. Japanese role playing games feature a party system, where the player can recruit characters in the game world to join their journey and assist them in combat. *Final Fantasy* (1987-) is one of the first Japanese role playing games and is the main series *Final Fantasy Adventure* is based off of. However, *Final Fantasy Adventure* removes the turn based combat and the party system, while persevering the role playing elements of leveling up and increasing the players stats. Like Japanese role playing games, adventure games often feature dungeons to explore and enemies to fight (Schuller, 2017).

This leads to a question of how are adventure games and role playing games different? Games are not confined to one genre; Adventure games can have character development and role playing games can have puzzle solving. Many games take elements from many genres and mix them together. The *Legend of Zelda: Breath of the Wild* (2017) let players level up their weapons and armor in the game, a mechanic traditionally found in role playing games. Role playing games give the player choices to change the story, develop their characters stats and build a character that reflects them. This is because of their roots in *Dungeons and Dragons* (1974-) (Schuller, 2017). Adventure games borrow some of these mechanics but traditionally did not incorporate them and early adventure games were point-and-click adventures like *The Secret of*

Monkey Island (1990). Point-and-click games have simple mechanics where the player clicks on a part of the screen to interact with it. The characters in the game world will then walk to the location the player clicked and perform an action like talking to another character, opening a chest or looking inside a book.

En's Adventure looks to combine the role-playing game elements of *Final Fantasy Adventure* with the traditional adventure gameplay game of *Legend of Zelda*, and the retro art style of both games. There have been attempts by other adventure games like the *Blossom Tales* (2017-2022) series to remove consumable weapons and use a stamina bar. The *Blossom Tales* (see Figure 4) series uses a stamina bar for every action in the game, which is only increased by finding items. A player could reach the end of the game without finding items to increase their stamina and complete the game with the starting value. *Final Fantasy Adventure* does not increase the stamina value but changes recovery time. This small difference leads to two very different styles of game play. *Final Fantasy Adventure* allows the player to choose to upgrade their skills, and if a player continues to invest experience points into stamina, the stamina meter will recharge quickly, allowing them to continue attacking with small breaks. On the other hand, *Blossom Tales* increases the stamina, but the recharge rate remains constant, leading to gameplay with a set number of attacks that can be performed, and when running out of stamina, the player must wait to regain stamina.

The approach of the mechanics of the *Final Fantasy Adventure* provides for more player choice, as they can choose how to upgrade their character, and makes the player feel more powerful as they level up throughout the game. For this reason, this is the approach that will be supported with this project and the mechanic will use a stamina bar based upon the *Final Fantasy Adventure* design. A leveling system has become common in many modern games

outside of the role playing genres. First person shooting games, where the player sees through the eyes of the character, like *Call of Duty* (2003) use a level system for online player and reward players with new weapons and badges to show off.

A stamina bar in place of consumable items, like arrows or bombs, changes the gameplay of as well. In *Legend of Zelda* the player can exhaust their inventory of arrows, but they can always use their sword attack. A stamina system changes this because there is not always an option for a player to attack. They have to perform resource management during the second to second gameplay and may also find themselves in situations where they have to avoid enemy attacks while waiting for their stamina to recharge. This in turn also affects enemy design because enemies and enemy groups can be designed around this to provide different challenges and situations to test the player's mastery of the mechanics.

Retro games remain popular today, with many people streaming speed runs and play throughs on websites like *YouTube* and *twitch*. According to Streamcharts.com, a channel called *RetroLongPlay* has been the second most watched channel in 2022. This is a channel dedicated to playing through retro games and allowing viewers to join the experience with them. Games have gone from simple 8 bits sprites on small television screens to expansive realistic worlds with hundreds of hours of gameplay. A question one might ask is why do these games, or retro games as a whole, continue to be popular today? Are retro games better designed games? Are they more fun to play, or maybe more challenging? These questions are too subjective to provide a concrete answer too, but approaching the popularity from a different perspective can allow conclusions to be drawn about the popularity of retro games today.

One of the factors continuing to drive the popularity of retro games is nostalgia. Nostalgia is not only abundant in the games industry but can be seen in remakes of old movies,

television shows and old products which become popular again. FioRito et.al (2020) suggest “Nostalgic reverie is centered around the self, important social connections, and personally meaningful life events.” Nostalgia allows us to reconnect to past memories and experience them again. A person can never watch *Star Wars* for the first time in a theater in the 1970s again, but they can watch the movie and remember the feelings they had during that experience. FioRito et. Al (2020) continue by saying “A growing body of research positions nostalgia as a psychological resource with self-regulatory implications. Negative affective states such as sadness, loneliness, and meaninglessness trigger nostalgia and nostalgia, in turn, enhances well-being, feelings of social connectedness, and perceptions of meaning in life.” This research suggests person experiencing sadness or loneliness can use nostalgia to overcome these emotions and remember a happier time they had with friends or an experience from their childhood. This can be used to explain the continued popular of retro games.

Nostalgia is not only used to reminisce about the past, as research suggests it can also be used to reason about future events. FioRito et. Al (2020) suggest “Nostalgia increases general well-being but also positively impacts motivation-relevant affect. For instance, nostalgia increases optimism” and continue by stating “as people get older, nostalgia makes them feel youthful and more optimistic about their health”. People can use nostalgia to positively impact their future actions by changing their mood and “nostalgia doesn't just make people feel inspired. It drives them to act on their inspiration.” (FioRito et al., 2020).

The third reason nostalgia can be attributed to the continued popularity of retro games is the concept of anticipated nostalgia. FioRito et al. (2020) explain anticipated nostalgia as “this construct is unique in that it does not rely on the reflections of the past. Instead, anticipated nostalgia is nostalgia for the present and the future (e.g., “I anticipate I will feel nostalgic about

my children's childhood in the future”).” A person playing or watching retro games receives a nostalgic feeling of playing games with their friends on their Nintendo Entertainment System; this same person then begins to anticipate the nostalgic feeling of playing video games with their own children in the future. This person may not have children but still begins to anticipate these feelings, leading to a positive feedback loop of nostalgia, which in turns affects their mood in a positive way. The person is nostalgic about their past experiences. They begin to think about future experiences, which will become nostalgic later in life; this same person begins to change their future actions towards this nostalgic goal.

Video games are receiving an explosion of money and research currently. According to Liquid Web, in 2021 the video game industry had venues of \$180 billion dollars (LiquidWeb, 2022). The market expansion has led to increased interest in research and game ideas. There are many areas of game research like psychology of play (Hullett, 2012), artificial intelligence (Broussard et al.,2016), procedural generation (Dormans, 2010), the role of games in education Barreto et al., 2017), among others. For this project, the primary research conducted involved level design in retro 2D games but also supplementary research in general game design, as well. The sources discussed in this paper provide a good overview of recent level design research including level layouts, enemy interaction and player psychology, while also providing supplementary material in regard to game design.

Current level design research involves a lot of procedural generation to have a computer create the levels completely, or in creating tools to be “versatile as it allowed designers to quickly regenerate previous sections with the same constraints but with new rule sets without having to redo a whole section by hand” (Dormans, 2010). With current progress in machine

learning and modern computing power, procedural generation has the potential to not only create levels and tools, but entire sections of games in real-time (Beukman et al., 2022).

This paper explores how retro games designed their levels and the way in which symbols and icons were used. En's Adventure takes the retro gameplay of *Legend of Zelda* and adds modern design mechanics including a stamina system to change how players approach the challenges in the game world.

Methodology

For the research for this project, a combination of formalism, semiotics and iconography were used. The research focused on level design for games, specifically relating to 2D games. Along with level design, general game design concepts were also researched.

Video games are very subjective, and not everyone enjoys the same types of games, but using formalism, it is possible to break down the components of games to evaluate them. Examining the components of a game in isolation, and along with the other parts of the game, one can understand how each part of the game works together. Everything in a retro game was designed and programmed by people; there are no random things in these games unless they are designed to be that way. A character in a first person shooting game who is unable to fire a gun and quickly dies is bad game design. In a different game, this same concept of not using weapons could be good game design.

There are a number of set patterns used in level design (although not applicable to every genre) to communicate different emotions or challenges to players. Looking at level design through the lens of formalism works well with looking at patterns used in level design. A common pattern in many side scrolling games, where the player moves from one side of the screen to the other and the background scrolls, is a short area before a boss fight to give the player a chance to rest and prepare for the fight. These are referred to as safe zones (see Figure 5) . Putting many safe zones in a level with no pay off afterwards will make the level feel awkward and slow because of the constant lull in play. Due to hardware limitations, many retro games for the *Nintendo Entertainment System* (1986) and *Super Nintendo Entertainment System* (1990), were side scrolling games.

Semiotics and iconography are similar in that they convey meaning to the player through images or signs. Semiotics focuses on communication through signs; while iconography explores the use of icons within art. Many video games use a white box with a red cross on it to communicate a health pickup to the player. The red cross is a recognizable symbol and allows anyone to instantly understand what interacting with the item will do. As graphical capabilities have evolved, artists and designers have been

able to use more symbols and imagery in games to create fantastical experiences only possible with video games. The pattern and rhythm in which signs are appear in levels is directly used to influence players because of humans positive associations with patterns (Salmond, 2021).

Literature Review

Every video game has a level or levels in which the game takes place. Early video games in the 1970s, such as *Pong* (1972), used one screen which functioned as a level for the entire game (The Guardian, 2022). Arcade games in the 1980s, like *Pac-Man* (1980-) and *Street Fighter* (1987-), began to make use of multiple levels with different colors or themes (Leone, 2020). As video games continued to evolve, so did the techniques used to design and develop levels. Level designers used to create levels on paper and then translate them into 2D levels using sprites (LaMothe, 1995); today powerful 3D engines like *Unreal Engine 5* (2022) have level editors built in. Level designers leave subtle clues throughout their levels to consciously guide players or communicate parts of the story (see Figure 6) . Using symbols is one of the most important techniques a level designer can use.

Level design is a very complex field, and for many people outside of the games industry, they may be unfamiliar with what exactly a level designer does. Co (2006) describes a level designer as “level designers create the spaces and environments that you move through and experience as you play video games.” Johnson (2003) says that “Level design isn’t something that can be easily defined in a sentence - it’s a far too varied discipline to confine to one area.” There are many facets to level design, and level designers need to work with the entire team; artists, programmers, and other designers (Co, 2006). Aside from laying out the level in a game engine, a level designer’s work also encompasses mission design, enemy placement, and game balancing (Rogers, 2010).

Over the years, level designers have begun to create patterns that are applicable to many different genres of games, and some of which are more niche for certain types of games. Khalifa

et al., (2019) describe these as “tips and tricks and tools of the trade to design levels. Some of these tips are based on their gut feeling and others have been known in the game industry for the last 30 years.” Level designers use established patterns to guide and influence player behavior. Shapes and colors can be used to guide players to specific parts of a level; a stack of platforms can indicate to a player to jump upward. Bright colors will draw a player’s eye towards an area of the screen, guiding them to the desired location (Khalifa et al., 2019).

Drawing a player’s attention to a portion (see Figure 7) of the screen can also be used to foreshadow an enemy later in the level or a mechanic much later in the game. Foreshadowing is a helpful pattern that can show players a new enemy or mechanic without stopping the game and explicitly teaching them. Foreshadowing is not limited to games and used across all media, including movies, television shows and books. When used correctly, foreshadowing can instigate players curiosity, getting them excited about the coming levels in the game, while also giving them an incentive to backtrack to previous areas after they have a new ability or have improved their skills, to revisit old areas and explore previously inaccessible challenges (Khalifa et al., 2019).

Branching is giving players multiple paths or options to complete an objective (Khalifa et al., 2019). Player choice has been increasingly popular in recent years, with games like the *Mass Effect Series* (2007-) designing the entire game around choices the player makes. Not all player choices have to impact the story: a simple choice of which path to take or enemy to fight empowers players and lets them feel as if they are a part of the story. Branching can also be used to provide a challenging path for more experienced players and an easier path for younger players or those less skilled (Khalifa et al., 2019).

Nintendo has been using these patterns for decades, and examples can be found in their early games before they were established across the industry. *The Legend of Zelda* series provides a small room before every boss fight, where players can refill their life and prepare to fight. *Super Mario Bros.* (1985-) uses coins to guide players to hidden areas and secrets in the levels. *Donkey Kong* (1981-) makes frequent use of safe zones to allow players time to think before a challenging platforming section. As games have evolved, so have Nintendo's design ideas. Nintendo now uses Kishotenketsu to guide their level design philosophies (Hayashida, 2012).

Kishotenketsu is a form of storytelling originating in China and consists of four parts - introduction, development, twist and conclusion. The introduction section introduces a concept or idea, the development section then expands on the idea, then a twist is shown to surprise the reader, and finally the conclusion concludes the story (Hayashida, 2012). Nintendo develops levels in *Super Mario Bros.* following the *Kishoutenketsu*, starting with an area for players to test and develop their skills. Then their a challenge to show mastery of the skills and finally a section to make them think of a new way of using the skills they acquired(Hayashida, 2012). The 2D *Mario* and *Donkey Kong* games make extensive use of this design idea and it allows them to have levels that all feel unique and provide interesting challenges.

Semiotics is a field that lends itself well to game design because symbols have been used in games since the beginning. In the original *Mario Bros.*, there are different items such as coins, mushrooms and flowers for players to collect (see Figure 8). The meaning of each of these items is never explicitly explained to the player, but after interacting with them, they can quickly understand their function in the game. In first person shooter games, a white box with a red cross on it is commonly used for a health pick up. The red cross is recognizable because of the Red

Cross organization, so players can instantly understand collecting this item will give them more health (Alexander and Venkatesh, 2016). A study by Alexander and Venkatesh (2016) argues that “the interactive exchange of game design, delivery, and immersion made possible through signs circulating between humans (end-users) and computers brings exponential consequences on the player and the contemporary state of game design.” These signs are also used to help immerse the player in the game world.

Designs can also get creative with their use of signs in videos, and use previously communicated signs to express new signs. In figure 7 there is a group of bananas in the shape of an up arrow. The bananas in *Donkey Kong* function like coins in *Mario*, in that collecting 100 will give the player an extra life. Collecting bananas rewards players and creates a positive feedback loop for them to engage in. As mentioned above, bananas can be used to draw players eyes to a hidden area or branching path in the level. In the case of figure 7, the bananas are creating an explicit sign telling the player to go up. Players may collect some bananas before they realize what the designer is saying to them and miss this sign entirely, but the places who notice it will be rewarded.

The *Legend of Zelda: A Link to the Past* (1991) placed small bushes all around the game world which the player can cut down, and may receive an item or health for doing so (see Figure 9). These bushes cover areas of the game and cannot be walked over; the player must go around them or cut them down. These bushes have become iconic in games that attempt to emulate the *Legend of Zelda* and have been copied many times in other games. When players see these bushes, they instantly recognize their meaning and the sign it conveys.

The position, rotation, size and location of each sign must be carefully considered by the designers. Placing a sign in a level can change the player's behavior and lead to frustration if there is no pay off for putting the sign there. Symbols and signs in games are presented by the designers and interpreted by the players. Following the classic principles of semiosis, the player must be able to interpret the sign and the intent must be clear to allow the player to understand a deeper representation (Alexander & Venkatesh, 2016). Games have rules, that if broken confuse players and can lead to undesired outcomes. If a game has an emblazoned red cross and the player picks it up and receives health; the next time they pick it up they will expect to receive health. If the next time the player picks it up they receive ammo, they may become confused and it can break the flow of gameplay. Designers must be careful to avoid these situations, and depending on the culture or country, symbols may be changed to avoid this.

Iconography is also extensively used in video games. Icons are used to represent character experience points and different types of items and skills, among other things. Güttler & Degn (2003) argue that "All locations and surroundings should have a purpose in relation to the game, otherwise are they not used by the players". Icons are not exception to this. When talking about a horror themed game, Güttler & Degn (2003) said "Carefully chosen lights, textures, proportions and modeling etc., create this realistic impression, a realism that only limited is connected to the actual terror-theme of the game." The same thing can be said of icons in games. The *Legend of Zelda* series uses hearts to represent the players health. When a player takes damage one of the hearts changes color, and when they gain life the hearts change back to the original color. The heart icon has been emulated in many games since like *Blossom Tales* and later *Zelda* games.

Game designers are creating the game and can picture the end product, but players can only see the end product and do not know the intent of designers. Designers need to be care to think about the players perspective to facilitate the correct experience (Aristov 2017). Game designers want players to play the game the way they intended, and many times, are often frustrated or surprised when they see someone doing an unintended action. Level design works to avoid this issue, and the patterns mentioned here are a small subset of the techniques a designer can use to do this.

There are many different genres of games, and games often mix different ones together. It is commonplace now to see shooting games with role playing game elements. However, the techniques discussed here can be applied to all games of any genre. Puzzle games do not have levels in the traditional sense, but they still use level design techniques like foreshadowing or a safe zone to give the player a break; signs are incorporated into the puzzle to give clues to the player. As games continue to evolve the use of these techniques will only increase and new ones will be added.

Results

En's Adventure was created in the *Unity* game engine and taking advantage of the *Unity* asset store to speed up development time. Assets were downloaded to help with combat, character movement, AI and art. The result is a small prototype that captures the excitement of playing a retro game, providing 4 different enemies, a boss fight and one quest for the player to complete. The assets related to gameplay allowed for quick and dynamic iteration, which led to the implementation of more enemy types. The stamina system is fully implemented with every combat action costing stamina. Time was taken to balance the amount of stamina for En's Adventure taking into account how the gameplay changes with more or less stamina.

Similar to the gameplay of *Legend of Zelda*, the game features two weapons for the player to use; a sword and a bow and arrow. The bow is found in a dungeon and used throughout the dungeon to test the players skills. Following the previously mentioned level design research En's Adventure also makes use of safe zones which restores the players health points before the dungeon's boss (see Figure 10) , foreshadowing by showing chests the player cannot reach unless they take a different path (see figure 11), player choice giving multiple paths through the forest (see figure 12), and symbols in the place of hearts to represent health points and a gem to represent money (see figure 13). The game also has grass which the player can cut (see figure 14) and has a small chance of receiving an item after doing so; directly inspired by the *Legend of Zelda*'s iconic grass.

The assets from the *Unity* asset store, greatly contributed to develop time, but they also provided constraints to the project as well. The assets used for gameplay had to be modified to achieve the exact style of gameplay provided and these changes started to add up over time. The art assets provided a nice package of cohesive art for the entire game, but they were also limited

with what they offered; leading to creative uses of assets that was not their intended use (see figure 15).

Conclusion

The goal of En's Adventure was to create a prototype of a retro game with modern mechanics that could be expanded upon to a full game., celebrate the influence of games like *Legend of Zelda* and *Final Fantasy Adventure*, and use the past decades of level design research to create engaging levels for players. En's Adventure is a starting point for a full game, but requires a lot of work to take it from prototype to released product. The assets used from the *Unity* asset store contributed to rapid development and prototyping, but will hold the project back if it were to turn into a full game. Rewriting most of the code would be time consuming but allow for a custom experience tailored perfectly to this game, and speed up development as time went on.

Figures



Figure 1: The *Legend of Zelda*



Figure 2: Stamina bar in *Final Fantasy Adventure*



Figure 3: *Final Fantasy* turn based combat

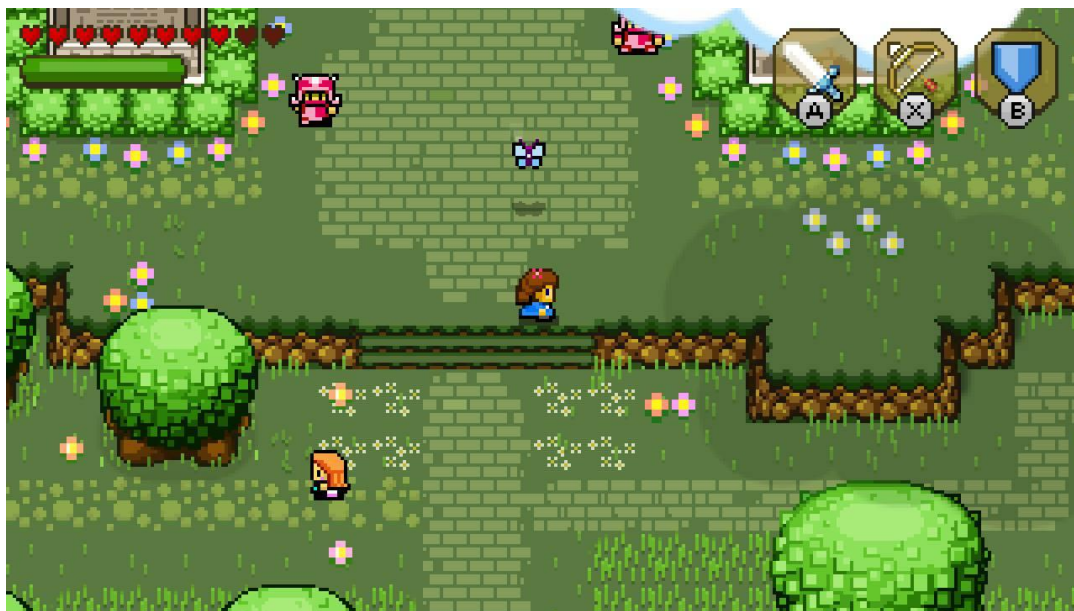


Figure 4: Stamina bar in *Blossom Tales*



Figure 5: Safe Zone in *Mega-Man* (1987-)



Figure 6: Guiding players subconsciously in *Banjo-Kazooie*



Figure 7: Guiding players using bananas in *Donkey Kong*



Figure 7: Use of mushroom in *Super Mario Bros.*



Figure 9: Grass in *Legend of Zelda*

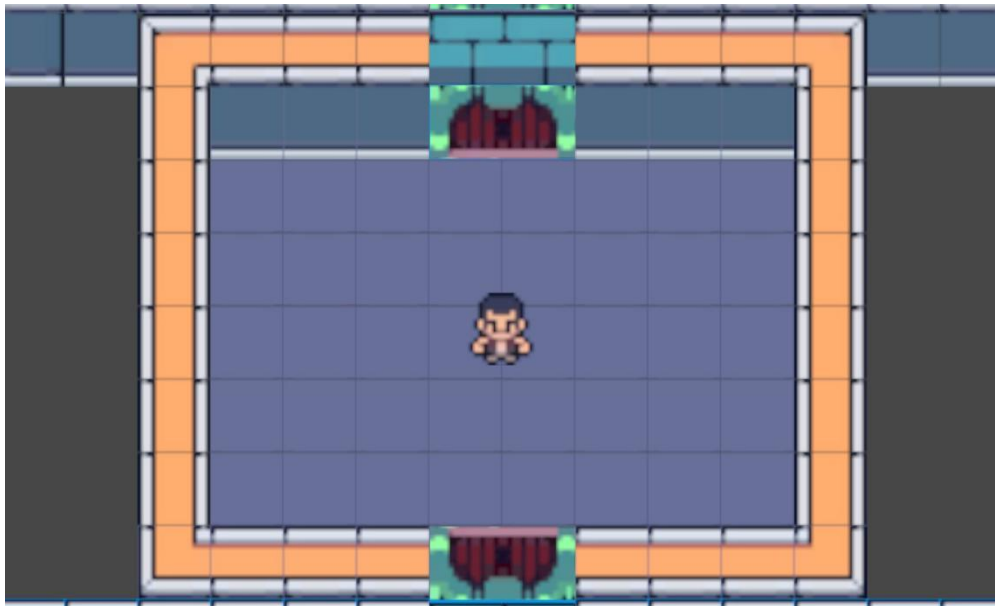


Figure 10: Safe zone before boss fight



Figure 11: Foreshadowing of chest



Figure 12: 3 different paths providing players a choice in the level



Figure 13: Use of icons for health and money in En's Adventure



Figure 14: Grass in En's Adventure



Figure 15: Castle made from various art assets

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