

Level Designer

Microsoft ★★★★★ 5,157 reviews - West Midlands

Apply On Company Site

Location: RARE Studio, Twycross, UK
Salary: competitive plus benefits

Rare: we're not your typical developer. Our 30+ years in the game-making business have been dedicated to crafting one beloved title after another, constantly trying new things, and infusing the fun we have every day into the games we create. Check out the **Rare Replay** collection for three whirlwind decades of evidence! We strive to keep Rare a fantastic place to work, from its beautiful location and state-of-the-art facilities to a strong focus on work/life balance. If you're a keen gamer, chances are you've already taken to the seas in our epic shared world pirate adventure **Sea of Thieves**, which launched this year. With every day bringing new challenges and discoveries in equal measure, there's never been a more rewarding time to join our daredevil crew!

Responsibilities

ROLE PURPOSE

Are you hungry for change? Are you passionate about building worlds? Do you believe in the magic of game development? If you have the spirit and passion required to take on new opportunities and enjoy solving creative challenges, we're looking to bolster our design team with creative, passionate and inspiring individuals. As a Level Designer, you will be responsible for creating the living stage on which incredible player-created stories can take place – reporting to the Lead Level Artist, you will work together with Game Designers, Writers, Artists and Engineers and be responsible for the creative design and technical implementation of our game worlds.

KEY ACCOUNTABILITIES

- Work with the Creative Director and Lead Level Artist to design scalable open-world adventure environments.
- Be a hands-on developer responsible for planning and developing new areas and working with a cross-discipline team to bring them to life.
- Liaise with the gameplay team, ensuring we create a world suitable for our gameplay requirements.
- Represent the world group in design meetings and ensure unification across the project.
- Represent design thinking via prototyping techniques.
- Write designs clearly and concisely.
- Equally comfortable expressing bold ideas and design on paper, whiteboards or other mediums.

Qualifications

REQUIRED SKILLS AND EXPERIENCE

- A minimum of 3 years' experience in development as a Level Artist/Designer, specialising in world creation.
- Understanding of how tone, ambience and gameplay mechanics work together in creating immersive worlds.
- Experience in world or level building in one or more current generation engines/modelling tools (for example: UE4, Unity, CryEngine, 3DS Max, Maya etc.).
- Good problem-solving skills with the ability to suggest creative solutions.
- A passion for playing open world games, and a desire to build unique and innovative experiences.

Desirable characteristics

- Have shipped several AAA Console/PC titles as a World Designer/Level Artist.
- Self-motivated, passionate, proactive and organised, but able to have fun whilst being all those things!
- A collaborator, able to work well within a multi-discipline team and excited at the prospect of doing so.
- A keen interest in building open worlds and a desire to learn.
- Open minded about defining new development approaches and eager to try new approaches.

An important element to research prior to starting this project is job listings. This will determine what qualities and skills I need to possess in order to become a level designer in the industry, as well as highlighting which characteristics I have already attained. Without knowing these, I would be under prepared for interviews, lacking in my portfolio and therefore, will lose out on jobs.

On the left is a job listing from RARE studios. From this listings description, I would love this position once I have more experience and a stronger portfolio. Although I have been creating worlds during my free time, college and university, I feel I need to continue improving my craft in this area, which this project caters for. This project also caters for understanding tone, ambience and gameplay mechanics working together in UE4, through the aesthetics (created in Maya) and the mixture of mechanic based puzzle shrines integrated into an open world. This project could deliver a lot of problems, however, I feel that with the extensive pre-production and research, I am proving that I have good problem solving skills.

Level Designer

SAVE



Playground Games
Cublington, Leamington Spa

Apply on LinkedIn

Over 1 month ago Full-time

Description

Playground Games is looking for a Level Designer to further strengthen our world class design team. As a member of the design team on a AAA title, you'll take responsibility for large sections of the game's level design, as well as mentoring and leading junior teammates.

You will be a part of the level design team on our next AAA title, responsible for creating fun, playable gameplay experiences. During pre-production you will work closely with environment artists to create and iterate whitebox environments which prove core gameplay concepts. Subsequently you will use 3DS Max and proprietary tools to mark up these environments with detailed gameplay information, and tune this gameplay into a high-quality console experience.

Skills Summary

- Excellent communication skills
- Candidates must have experience with at least one 3D software package
- Excellent listening skills
- Experience using level design tools to create working levels (preferable)
- A genuine passion for games

Above is a job listing from Playground Games. From this listing, I feel that I provide excellent communication skills, both in verbal and written sense, being clear and concise in order to get the point across, as well as being extensive to achieve the best product possible. I already have experience with Maya and partially 3DS Max, as well as UE4 and Unity, however, this project will tap into improving my skills in both of those also.

Along with this, I feel I have excellent listening skills and have experience using level design tools to create working levels, shown in a number of games in my portfolio, as well as illustrating this in the Honours project, through the use of creating a finished game in UE4. Although I have already gathered most of the skills I need for this position, I feel that with this project at the forefront of my portfolio, I will have a better chance of gaining a job post graduation.

To the left is a job listing from Sumo Digital. Although I covered this listing in my Specialism last year, I feel this project will provide a more in-depth knowledge of blueprinting, use of Office suite softwares through my documentation and a more extensive knowledge of design tools, level editors and organisational skills.

Level design

2) Sumo Digital: Level Designers

The responsibilities for this position include:

- Being able to collaborate with all departments to create innovative and memorable levels.
- Understanding the role of narrative in creating immersive experiences.
- Being able to drive the vision of your levels through development, from start to finish.
- Plan, execute and refine levels.
- Being able to hone levels and direction based on feedback.

Skills and Knowledge for this position include:

- Good knowledge of scripting languages (such as python, LUA etc.);
- Basic understanding of level design tools and software as part of the production pipeline and workflow;
- Good knowledge of Microsoft Office suite software (such as Word, Excel, PowerPoint, Visio etc.);
- Basic understanding of 2D and 3D design tools (such as Sketchup, Maya, 3DSMax, Photoshop etc.);
- Good knowledge of level editors;
- Good communication and interpersonal skills;
- Good analytical and problem solving skills;
- Adaptability and proactivity;
- Good organisation skills and attention to detail;
- Good understanding of consumer needs and market trends;



Job listings, attributes and skills

Looking at job listings is a great way to discover what skills are required for a job in the industry. Without this knowledge, my portfolio will not be as strong as it needs to be and therefore, could cost me a job in the future. Also knowing what skills to hone early allows for more preparation time and will aid projects both at university and in the industry. Looking at potential companies I would like to work at such as Sumo Digital, Ubisoft and RARE, allows for a more specialised project, covering the skills and elements which they look for from their applicants. A more specialised portfolio for a specific company will be more beneficial than a general portfolio, as it illustrates that I can cover the aspects which the company require on a day to day basis. This research over this page and page 1, will allow for a more specialised project, as I can see which elements the project covers and which it does not, therefore, I can modify the project to show off the required skills necessary.

JOB LISTING

As stated above and on the previous page, job listings are very important to look at for reference of required skills. As Ubisoft is one of my favourite companies in terms of games which I play, looking at one of their job listings will be very beneficial in case I ever wish to go for a job there. Also, as they are one of the biggest gaming companies in the world, it will provide insight into the requirements into one of the positions from a AAA studio, as they will be looking for the best candidates to create the biggest games.



UBISOFT

UBISOFT: Junior Level Designer

The responsibilities for this position include:

- Being able to create, document and tune levels.
- Assist with testing new features and tools
- Communicate and collaborate with key stakeholders about direction of the project and consistency of work.
- Develop an understanding of Rational Design theory.
- Work with internal quality control team as part of any debugging process
- Play test and observe player actions and change levels based on feedback.

<https://jobs.smartrecruiters.com/Ubisoft2/743999658151370-junior-level-designer-164-?codes=1-INDEED>

In terms of the responsibilities, I feel that I cover most of these bases, proving I can create, document and tune levels in previous work and in this project, effectively communicating with tutors in the past who have been taking the role of stakeholders and presenting to peers about the direction of projects, such as the 2 Specialism projects in Year 2, I have worked on debugging games which I and others have created for a number of years and I have worked with playtesting and iteration on many of my previous projects at college, university and in my own time.

The only real concern from this listing is that I have not looked into Rational Design theory, however, there is an article discussing this, so upon reading that, I will have illustrated that I can cover all responsibilities for this role, therefore, applying to similar positions in the future.

FEW MORE GAME DESIGN TIPS

IMPACTING THE GAME: Every decision from every employee impacts the game. Game Design is not solely about creating fabulous stories and concepts, it's about the final product, meaning you must be able to illustrate both the creation of concepts and the ability to turn them into a finished product.

FINISH THE GAME: No game is ever done, designers will always find things which should have been done better/ differently, find things which could have been done and features they would have liked to have implemented. However, the game has to ship eventually for players to play it, meaning it has to be 'finished' at some point, so learn to be able to call it done. Write other ideas down and file them for later projects or DLC/ patched content.

SKILLS TO HONE TO BECOME A GAMES DESIGNER

To become a games designer, there are certain skills which I need to hone and practice in order to have the best possible foundation to build upon. Some of these are very general, however, some are more level design based. I still feel all these aspects are important, as lacking in one of these elements could be a reason as to why someone else gets a job over me. These points have come from game designers in the industry, gathered from an 'Extra Credits' video.

COMMUNICATION: Ensure you can communicate to different teams working on the project, e.g. audio, publishers, artists, as if you cannot, the quality of the idea will drop and confusion will occur. To ensure all teams are working towards the same vision, clear communication is vital.

CRITICISM: Introspection and ability to take criticisms are essential, especially when testing. If you are too attached to game, you might not change it and end up with a flawed game. All games require testing and iteration, therefore, ensure enough time to playtest and make changes. If it is not working completely, try something new which will work.

STUDY GAMES: Study, analyse and break down existing games. See where break points and triggers are and reverse engineer the ideas, then try to figure out why it is good or bad and how it could be fixed. Looking at why something is broken/ not fun is as important as why it is fun.

SCOPE: Ensure the planning and scope is correct or it could lead to an expensive and failed game.

PRACTICAL SKILLS:

- 1) Have high level technical writing skill: Ensure grammar, spelling and punctuation is all correct.
- 2) Be grounded in logic: Not being logical can cause situations and expensive errors
- 3) Interest/ basic understanding of psychology: This can help decipher player/ character behaviors
- 4) Understand medium working in: Know the fundamentals of how computers work.
- 5) Have a solid grasp of maths: This will help balance economies, in coding, with time etc.
- 6) Have good knowledge of literature, philosophy and myth
- 7) Understanding of religions across the world
- 8) Have basic understanding of scripting/ programming ability (Blueprinting, Lua, Java)
- 9) Have an understanding of audio design and musical principles
- 10) Understand art principles (Sketching/ Photoshop is a plus)
- 11) Practical knowledge of graphic design.
- 12) Have a thorough library of games- more games played/ experienced = more to draw from.
- 13) Life experience: Cannot craft without having experienced yourself. Good primary research.
- 14) Make games: Paper games, board games, digital games (GameMaker, GameSalad)

I feel as though I have a lot of these elements, however, they can always be improved upon. This research is good as it ensures I have the foundation skills required to be a games designer and although they are not all required all the time, they are good to have a knowledge on and will all be useful over time within the industry, both in a personal and a professional sense.

Level Design research: Environment/ landscape

As the game features an open world for the player to explore with their abilities, this section is dedicated to researching different landscapes and environments, both stylised and natural. The reason for this is that the game is going to be bright and stylised, with different coloured ground for each sub section of the terrain, however, looking at real life references can give a better illustration of spacing and layout. The images below will guide the game's landscape style, as well as unique area types to explore within the game.



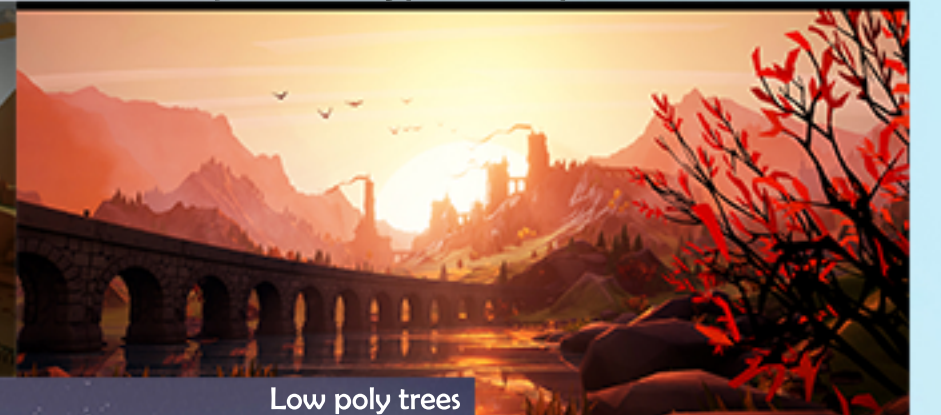
Legend of Zelda BOTW



Purple flower ground



Low poly landscape



Landscape environment



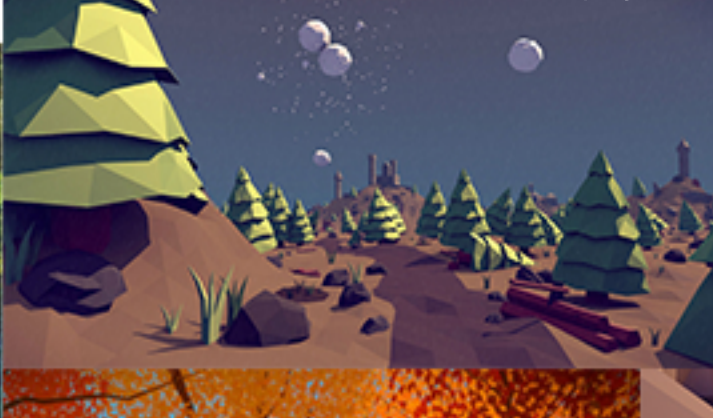
Legend of Zelda BOTW



Low poly camp landscape



natgeotravel Sabah, Malaysia



Low poly trees



Mountain valley



Low poly woods



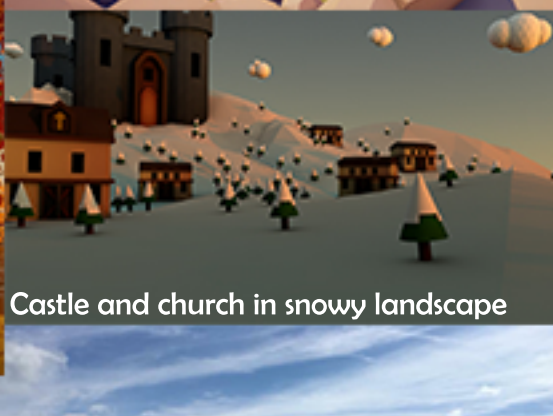
Hilly woods



Low poly snowy scene



The Witness orange ground



Castle and church in snowy landscape



Darker atmospheric environment



Low poly village



Low poly snowy scene



The Witness

Low poly sunset



Primary research hilly environment



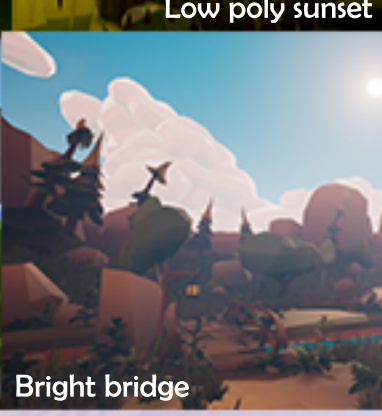
Natural Skyrim environment



Low poly woods



Bright bridge



Flowing river

Level Design research: Exterior (focal points/ signposting)

Although I have covered the landscape and environment on page 3, this section is going to cover the detail involved within the environment and possible elements placed within the world space. The coloured ground images in the mood board represent real world examples of how the sub sections will be coloured in the environment of my game. The paths will be a guide for players to reach the shrine/ puzzle areas, with focal points also being a guide towards showing the player where they have been and where they are yet to go, as well as being POIs for the players to explore if they stumble upon them, some of which only available to explore once certain abilities are unlocked.



Yellow ground



Legend of Zelda: BOTW



Low poly castle focal point



Low poly bright fantasy



The Witness focal point



Brown coloured ground



Green ground



Fortnite focal point



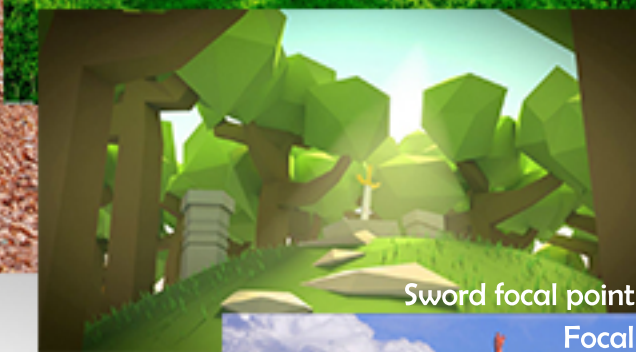
Orange ground footpath



Footpath



House on hill



Sword focal point



The Witness brown footpath



Cabin in the woods



Path in real life



Cabins in the woods



Focal points in real life



Rock monument



The Witcher



Footpath with waterfall

The mood boards on pages 3 and 4 show a visual illustration of how the landscape and exterior is going to look. As the game will be stylised, the low poly elements illustrate different types of stylisation which can be created, whilst showing that even stylised low poly visuals can look effective. The reason this project will be low poly is due to time constraints and the nature of the project. As the project is focused on level design, I do not want to spend too long working on modelling, so low poly stylised graphics are the fastest way to achieve this. I also find stylised games, such as the Long Dark and The Witness, can still be very visually rich and impressive, so that is one of the goals for this project. The idea of the sub sections being differently pastel colours depending on the section would not work to the same degree in a realistic game either, as even though there is some research on coloured ground in real world settings, the bright pastel colours which I am aiming for, do not fully fit within a realistic world setting, due to how bright and stylised they are. A stylised aesthetic is better for this project too, due to the mechanics being unrealistic, such as the ability to triple jump, teleport and manipulate time etc.

In terms of the exterior, a lot of the research focuses on focal points, signposting and paths. The reason for this is that the game is not going to feature waypoints to follow, as I feel this can limit the exploration of games, with players just going from waypoint to waypoint. As this is an exploration game, it will take a 'Legend of Zelda: BOTW' approach and not feature a waypoint system, with players having to explore to find the shrines. As this is the case, players need to be able to easily make their way over to each area without getting lost, as this can be frustrating, leading to players ending the game prematurely, so to counteract this, a good use of paths, focal points and signposting, on top of the sub sectioned areas should be able to guide players to where they need to go, without explicitly telling players or them getting lost, which makes the game feel more open, allows players to find hidden areas and makes them feel a sense of wonder upon discovering new things.

OPEN WORLD GAMES

Open world games: 2 structures

1) World as one: Slot towns, dungeons and open world encounters in world as see fit, e.g. The Elder Scrolls. The advantage of this method is that it feels more seamless than modules.

2) Modules: Split into loosely defined areas, each with a mini narrative running through each, e.g. Boulders Gate. This creates a framework allowing designers to craft strong narrative in an open world environment without losing exploration. This type requires more planning but can feature borders to split the sections.

This game will be a world as one, allowing players to explore the whole map whenever they wish, without having to wait to get to a new area. This makes the game feel more seamless, allowing for a better flow whilst exploring and allows for a higher level of engagement, as having to wait for a loading screen to take players to a new area can take away the game's fantasy.



SPACING TYPES

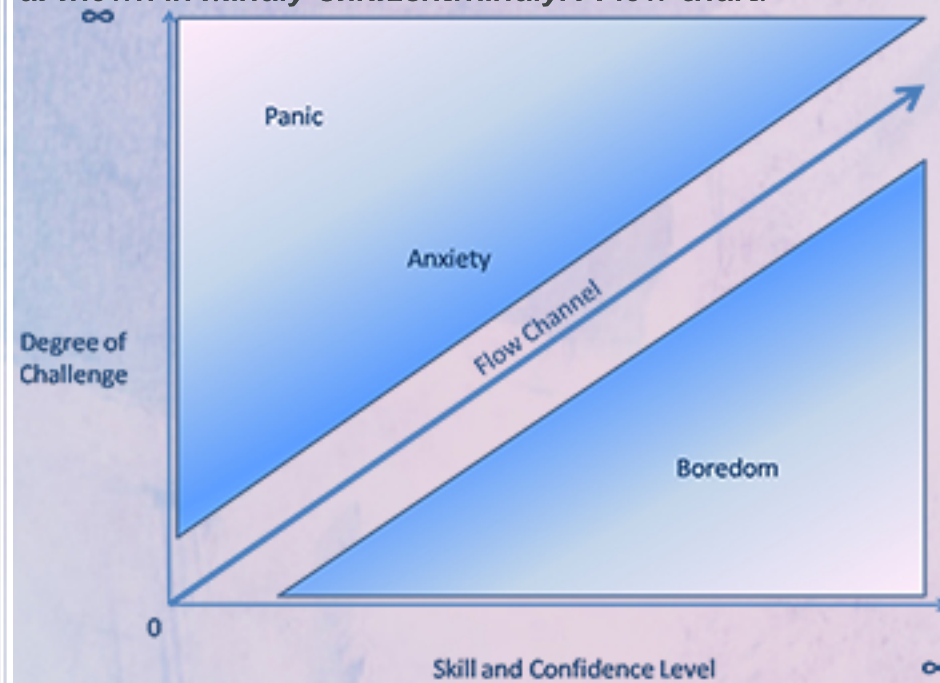
Types of spacing include linear (one way round), web (different sub spaces interconnected to form a web), grid (only move in 4 directions), divided spaces (seamless open world split into spaces) and open world (allowing players to wander one big open area).

This project is going to lean more towards divided spaces, as there will be different coloured areas, making up one big seamless map for players to explore, each area having its own name/ shrine.

PACING

Decisions and tension

Meaningful decisions cause dramatic tension and stop players achieving goals when they come across problems to overcome. Games have to raise the tension and skill required as players gain more skill and experience in order to keep them interested, as shown in Mihaly Csikszentmihalyi's Flow chart:



- Intensity: Impact of the events and moment to moment gameplay has on the player. The intensity needs to be related to the skill level of the players.

- Difficulty: The summation of the above, and its effect on the overall difficulty of the game.

- Depth: How many options available to the player (e.g. choices). Increasing intensity, difficulty and depth provides a better flowing experience, one which can keep players interested longer.

Each puzzle will add more depth to the game, as it will allow players to get to areas they could not get to previously as they lacked the skills. Each puzzle will be split into 3 sections, ramping in difficulty and intensity to keep players engaged and focused.

FOCAL POINTS/ SIGNPOSTING

Different ways to signpost where to go to players include:

- Focal points in the distance causing players to want to explore.
- Signs which players can look at to determine which right path.
- Consistency in environment, implicating new areas with changes.
- Landmarks and lighting can be used to signpost where to go, as human's eyes are naturally drawn to light and huge areas.
- Smoke helps create contrast that player instinctively follows.

LANDSCAPE/ ENVIRONMENT

A few environment techniques which can be used to keep players interested include:

- Overlapping environment: Can be used to create interest as it lets players see where they are going to end up.
- Spectacle: Anything which makes players say 'Woah'. Anything which feels spectacular in real life e.g. explosions, creatures, background, monumental buildings, ground armies or novel can engage players interest in a game and lead them towards it.
- Variety of spaces: Bridges, forests, library, harbour, tunnels, mountains, towers, cities, hills, caves, tombs, all have a different feeling to them and changes the environment, peaking interest.
- Use Ma (Japanese): Give players rest time using negative space to make them think about what has happened, allowing them to appreciate the plot and action sections more. Ma allows players to have a subjective experience over just an objective one, e.g. 2 people watching a sunset (objective experience) can have 2 separate feelings about it (subjective), however, without stopping to think about it, they cannot have that subjective experience.

Moments with nothing, e.g. crossing a landscape, allows time to process the game and gain meaning, even if only at a subconscious level.



INDIRECT CONTROL

There are a few different ways to make the player do what you want them to without telling them directly.

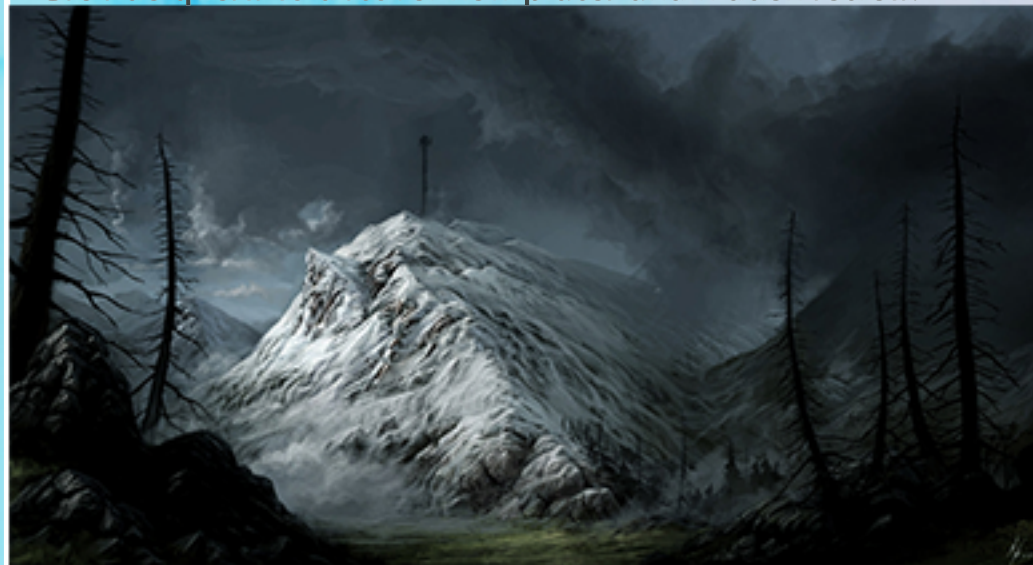
- Visual design: Pathways, lighting, cities, focal points, landmarks, smoke, sticking out ledges etc. to catch the players eye.
- Constraints: Barricades and walls for example can stop players being able to leave the area they need to go.
- Goals: Having a goal in a particular area can make players instinctively head towards it.
- Rules: If the game world forces players to go towards that particular place, they will not have much option not to.
- Interface: Using waypoints and UI reminders can tell the player where to go to stop them from wandering.
- Characters: Having characters telling the player where to go and what to do can guide the player
- Music: Having a different type of music play when the player is in the right and wrong sections can subconsciously guide the player.
- Paths: Jesse Schell suggested that if the player is not going where want to go, put a path there.
- Corners: Corners are also interesting, as players will want to explore what is happening around it as they cannot see from where they are.



EXTERIOR TECHNIQUES

Below are some techniques which can be used when designing the landscape and exterior:

- Verticality: Using multiple paths in a linear space creates an illusion of choice, making the player feel they have more freedom.
- Architecture: Having buildings of a larger scale, feeling and purpose can evoke emotion in players and give places a sense of wonder, causing players to go visit them.
- Windows: Placing windows in different places can change the impact of the lighting, giving usual areas a unique feel.
- Frame views: Show players where they are going to go, even though they don't realise it.
- Focal points: Point players at something which players can see and can orient around/ to it, e.g. The radio tower in Slender.
- Stylised: Mechanics lead space, meaning set up the space around the mechanics. This will be important in this project, as the space needs to cater for all 9 core abilities, meaning there needs to be places in each area for each ability to be used, as well as ensuring mechanics cannot be used to take advantage or break the game.
- Ensure environments are easy to navigate and not repetitive.
- Use side quests to discover new places and hidden secrets.



COMMUNICATING WITH THE PLAYER

Some ways the game can direct and communicate with players:

- Use NPCs to direct the player
- Use signposts
- Use scraps of information placed in cool locations
- Put information on paintings and in conversations
- Use riddles to direct way to places
- Use Semiotics such as colour and shapes to subconsciously give information to the player through real world defaults.

Making players take in environmental details is more rewarding than making them follow a single path line and using cryptic clues allows for more of an adventurous spark. This method also causes players to take in more of the environment and analyse details, as they are looking for clues as to where to go. This can also lead to more distractions for players to find, leading to more deeper exploration.

QUESTS AND EXPLORING

- Variety of side quests can lead to more valuable experiences and should be fun in themselves, e.g. find places in photographs-know what happened prior and gives more purpose than just adding XP. Also gives world more believability and feel more unique.

4 types of exploration in games (where joy comes from):

- 1) Geographic discovery (Skyrim, Far Cry): Joy comes in discovering new places after wonder of 'what's over the horizon'.
- 2) Mechanical discovery: Player finds/ better understands new elements or subtle fascists of game mechanics, new ways to interact with the world.
- 3) Content discovery: Like geographic but involves finding new things and objects in game over places, e.g. new Pokémon, a treasure chest told about etc.
- 4) Narrative discovery: Discovering new stories about place along the way. Searching for stories/ writing of world.

In terms of the exploration types in this project, players will be able to explore the landscape and shrines to find new places they have yet to visit geographically. In terms of mechanical discovery, when players enter the shrines, they will pick up a new ability/ mechanic, giving them more ways to interact with the outer world such as being able to reach locations they could not get to before, thus finding new elements in the landscape, which fits in with number 3 and 4, as when players reach these new locations, they will find different items which they have not seen before and find undiscovered narratives.



All this research is important as it allows for different methods and techniques to be used in order to make the game feel more unique and special whilst exploring, which keeps the player invested and engaged. If the game was a linear path with a waypoint, which kept them from exploring the game world, the game could quickly become very tedious and players would not play anymore.

For this project, I want players to be able to explore new places and be immersed in the environment and within the puzzles. The way that players can pick up new mechanics and go back to discover new places they have yet to discover, keeps the world fresh, meaning players can revisit areas they were finished with and reexplore, finding new things whilst advancing their skillset.

Level Design research: Interior/ shrines

In this game, the players will gain their new abilities and mechanics through shrines/ puzzle areas placed in designated sub-sections of the map. Although each ability has unique puzzles attached to it, requiring different layouts of the puzzle areas, the mood board below and research found provides a basis to work on and gives an implication of the general spacing required to ensure players are not overwhelmed by the amount going on, but also not too enclosed, as the puzzle pieces could become too simple to discover.



Elder Scrolls: Skyrim



The Witness



Legend Of Zelda: BOTW



Portal 2



Portal 2



The Binding of Isaac



The Room Three



Pokemon



Legend of Zelda: BOTW



Pokemon



Elder Scrolls: Morrowind



The Legend of Zelda: BOTW



Legend of Zelda BOTW



Legend of Zelda BOTW



Portal 2



The Witness



Inside a low poly cave



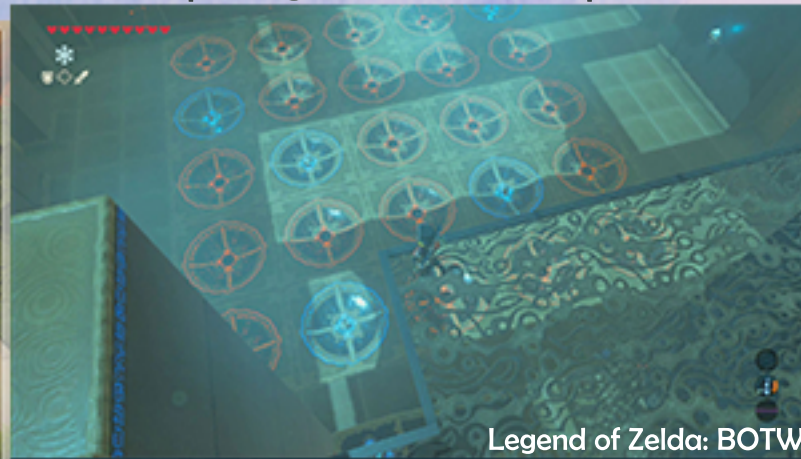
Elder Scrolls: Skyrim

Level Design research: Puzzle design

Puzzles are going to be a big part of the gameplay for this project, so researching this aspect, mixed with extensive playtesting is going to be very important, as this is a hard aspect to get right due to players needing to feel fulfilled and challenged, whilst not becoming bored due to the puzzle's simplicity. The mood board below shows a number of different puzzles such as mazes in The Witness, colour and rearranging puzzles from Zelda and a number of puzzles from Portal/ Portal 2. Researching this not only illustrates the way the puzzles have been laid out, but also shows the spacing used whilst the puzzle area is 'in-play' and gives a visual representation of how to achieve the end goal.



The Witness



Legend of Zelda: BOTW



PORTAL

RPG Maker puzzle



Monument Valley



Death Squared



Legend of Zelda: BOTW



Portal 2



Legend of Zelda: BOTW



Legend of Zelda: BOTW



Portal 2



Portal



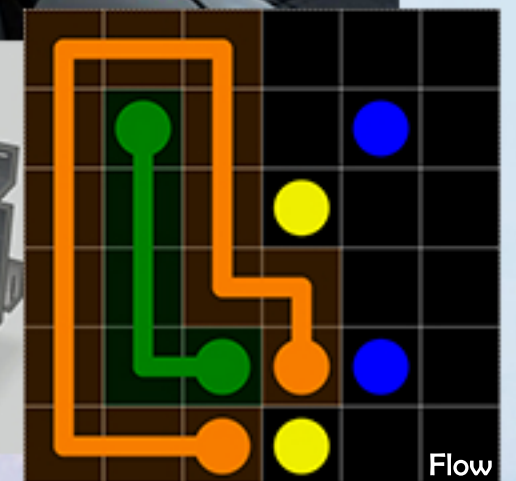
The Witness



The Witness



Portal



Flow

The mood boards on pages 7 and 8 illustrate different visuals into how other studios have created and set out their puzzles and shrines, with the big influences coming from Portal, The Witness, Skyrim, Zelda and Pokemon. The reason why I have chosen to look at these games is because they are some of the most successful games in the world, meaning analysing their space and puzzle design can influence the puzzles I create and allow me to make my puzzles great. One of the big elements which can be seen from the pictures in the mood boards are that the space is mid sized, allowing for players to have to explore to work out the puzzle, whilst not being so big as to cause the player to get lost and either get frustrated or bored. They are also laid out in a way where all the clues are there, but the players are trusted to think for themselves and put 2 and 2 together when they find the pieces, as this creates a 'Eureka' moment, making the player feel smart that they have figured it out. They are all also created in a way in which the player has to be very observant of the room space, which is something I wish to do for this project, as it will immerse the player further into the gameplay.

MECHANICS

In this project, players will learn a new mechanic every time they enter a new shrine. They will be given 3 puzzles to complete post learning how to use the new mechanic. The first puzzle will be quite simple to get the players to learn how to use the ability, with the second and third being tests, ramping in difficulty, in order to get players using the mechanic, whilst focusing more on solving the puzzle than what button to press in order to make the mechanic work, essentially giving a tutorial and throwing them in at the deep end to test their understanding.

The core mechanics which will be used for the puzzles are:

- 1) Triple jump (Could have platforms to jump to).
- 2) Crouch (Could have to crouch into gaps can't get round).
- 3) Time manipulation: Slow down/ Speed up time (Could have to manipulate time to get past obstacles on a linear path).
- 4) Pick up items (Could have to make box piles to climb, place blocks onto buttons, place coloured blocks on coloured squares).
- 5) Teleport (Could have room patterns which have to go in order and go through path blocking walls to get there).
- 6) Reverse time (Could be trail and error moving boxes, stand on platform which shifts and have to reverse time to put back).
- 7) Sprint (Could be fire/ cubes moving across, sprint past in gaps).
- 8) Grappling hook (Could be players climb up/ across platforms or used similarly to Widowmaker/ Just Cause/ Rocket League).



Even though the player will pick up one new mechanic from each shrine, when they re-enter into the open world, they will be able to use mechanics together. This gives more possibilities when designing places for the players to go to find new secrets in the world space.

CHALLENGES/ PUZZLE TYPES

When designing puzzles, there are different types and challenges:

- Make players show mastery in interesting situations, if players fail but feel they are getting better, they will continue.
- Make players use their problem-solving skills, special awareness and create mental challenges.
- 2 types of puzzles: Ones with 1 solution or ones with multiple. Ones with multiple tend to be better for replayability/ can be less frustrating to solve if cannot work out exactly what is intended.
- Make each puzzle into a minigame for players to solve.

LARGER FORM- DIFFERENT TYPES OF PUZZLE INCLUDE:

- 1) Accelerating: Continuous puzzle ramping up in difficulty
- 2) Linear: Have to complete one puzzle to unlock the next one
- 3) Sawtooth: Complete puzzles in any order in that section.
- 4) Semi linear: Complete puzzles to progress choosing route.
- 5) Ordered collection: Similar to linear but can skip to the end.
- 6) Solving 1 puzzle unlocks the rest of the puzzles, e.g. tutorials.



The theory of fun- Raph Koster: 'We play games because we seek to master the patterns- learning is fun and interesting then using the mastered skills creates more fun': This quote outlines how the puzzles will be set up, teaching the mechanic to the player to have fun with, then once they have practiced with it, allowing them to have fun using it to master puzzles.

The puzzles which I create need to be fun but challenging, whilst not being too easy to decipher. In order to achieve this, a lot of playtesting will be required.

PUZZLE FLOW/ PUZZLE CREATION

Some methods for creating puzzles include:

- Have 2 elements which seem in conflict with each other, e.g. a door and a button, if the button is not pressed, the door is locked, but cannot reach the door whilst pressing the button.
- Make the player have a revelation, make it simple to understand once know how to do it, whilst making players think outside the box.
- Make players use this understanding for future puzzles, causing them to make assumption on how it is solved due to how they solved previous ones before throwing in a twist and causing the player to have to rethink. THIS LEADS TO THE EUREKA MOMENT.
- Making players think they know how to solve a puzzle is also a good way to avoid players being overwhelmed, as they have a starting point.
- Make players think logically, strategically and critically about the situation, taking it a step at a time to get through to the end. To achieve this, do not make it too obvious, e.g. cube on a bridge over the button; make players realise they have to place it on the bridge, then remove the bridge as there is more thinking required.



- Give players the pieces and make them figure it out and test different ways.
- Should be minimalist with no extra elements, as too many can lead to them not being part of the core of the puzzle or becoming too complicated.
- Have clear feedback, if completed correctly, light up green.

Level Design research: Aesthetics/ Lighting/ Models

The lighting and aesthetic of the models are going to be very important elements in the design of the game. Despite the models being low poly and stylised texturing all of the games elements need to work together in order for the project to be a success. The models are going to look in a similar style to the church asset below, with the landscape looking more like the bright landscape image. The game will be bright, however, there will be some interior section for the puzzle shrines and in the environment, meaning the interior lighting, as well as the skylight, are going to be important factors, as a dark lighting effect will not empathise the bright landscape in the same way as bright lighting.



The aesthetic mood board looked into imagery focused on bright landscape colouring, low poly models and visuals, as well as different lighting styles. The reason for looking into these factors is due to the fact that the game will be brightly coloured, the lighting is going to be an important aspect and the models are going to be created in a low poly fashion. Aesthetics are very important in games, as it covers all the senses, primarily the visuals of the game. If the visuals of the game are not up to a professional standard or are not finished, the game will not be ready to go into my portfolio, meaning more time would have to be spent on this project instead of getting a job, so researching the aesthetics, lighting and models I wish to put into the game early, means this can be catered for.

AESTHETICS

Finite underlying reasons why we enjoy the games:

- 1) Sensations (Game as a sense of pleasure): Stimulates the 5 primary senses- go back to over and over for visuals/ audio.
- 2) Fantasy (Game as make-believe): Step into role can't do in real life, boils down to essence e.g. COD, FIFA, Rock Band.
- 3) Narrative (Game as drama): Stories and human drama, e.g. Sims, Journey, Mass Effect 4
- 4) Challenge (Game as obstacle courses): Engagement find in overcoming arbitrary obstacles. Core of any Mario, COD, charades games. Challenges help to deliver the difficulty. e.g. Kirby's Epic Yarn has challenge as a core but players cannot lose the game, however, the joy is overcoming the obstacles.
- 5) Fellowship (Game as social framework): Work cooperatively as a group to overcome goal, desire to work as pack, e.g. WOW, TF2, Borderlands.



- 6) Discovery (Game as uncharted territory): Uncovering new (landscapes, parts of map, recipes, new cards in Magic, systems, mechanics). New emerging interactions, finding anything left to find and discover which haven't seen.
- 7) Competition (Expression of dominance): TF2, WOW, COD, Starcraft, FIFA and in social games too.
- 8) Expression (Game as self discovery): Human innate to express ourselves, e.g. in the clothes we wear, games we play, personal appearance. Let's express some part of self i.e. WOW classes,
- 9) Submission/ Abnegation (Game as pastime): Tune out disengagement e.g. Farmville, Rolling Sky, Bejewelled.

There are a few core aesthetics that every game in every genre holds/ have in common. Delivering on core aesthetics is what makes great games over bad game clones.

STYLISATION

Our brains cannot understand all of reality as there is too much stimuli, so it turns to the subconscious to come up with model of reality, however, the subconscious is an illusion of experience. This is why stylised games can still look very pretty and life like, e.g. Fred Flintstone only has 3 fingers and 1 thumb with an outline but this matches our internal model of a human due to having other similar characteristics.

Having lines and rules in games allows player's brains to not be overloaded with information and can distinguish items from each other.

The brain can focus on specific things, e.g. focus on the main dialogue and drown out music or the nature in background. This can be used in games to grab the focus of the players mind and keep them engaged.



TEXTURING THE MODELS

Some notes for when I am texturing the models for this project:

- Base colour: The base colour is the lightest colour that will be on the object.
- Materials: Add any detailing texture on top in a darker colour than the base colour to provide a mixed gradient.
- Shadows: Any object/ part of the model that would make a shadow, paint darkly in the corners. Any area which would cast a shadow has a darker colour, e.g. around the corners of a fence.

COLOURS

- Primary colour wheel: Colours opposite each other compliment each other. These colours are seen as pure and strong together.
- Secondaries: Primary mix, visually strong and not as kid like.
- Tertiary colours: Secondary colour mix, not quite as strong.

MODULARITY

Modularity is important when creating low poly landscapes. This section is dedicated to research around modularity.

Essentially reusing assets, modularity maximises the amount of work done as developers do not have to remake things. It is also good for flexibility and performance, as the engine only has to render 1 tree but change position, rather than hundreds of assets. This causes less draw calls, which saves CPU and GPU processing time, meaning frame rates will not drop due to this.

Another reason why modularity is efficient is down to flexibility. Modularity allows for large iterations to be completed at once, allowing for faster iteration times too.

One method to avoid the look of repetition, is to change the texture, but keep the same model, e.g. in Gears Of War, the cars, sandbags and other elements are the same size to provide cover for the player, just with a different texture.

The more stylised the game, the more modularity can be forgiven. However, if the game looks too modular, it can throw off the spectacle of the world, as the landscape could look very repetitive, meaning it must be used thoughtfully, with each asset being designed to have a purpose and reasoning for being there.



LIGHTING

The lighting will be used to highlight features to create a greater level of prominence to chosen elements. It will also be used to guide the player to ensure they can read the path ahead and make the world appear believable.

Lighting will be an important aspect in order to make the world brighter and allow certain elements to stand out. It will also be important in the shrine areas to ensure players can see/ guide players to where they need to go. There will also be a skylight, which I will be testing to see which colour looks the best and gives the world the best appeal in parallel to the game's visuals.

Level Design research: Mechanics (Blueprinting/ scripting)

The core mechanics were decided on very early and were implemented into the game within the second scheduled week. This allowed for more time to be taken to get the documentation completed, to ensure the mechanics were achievable to put in and to allow more time for puzzle creation, as the Specialism project in year 2 was lacking a bit of research and took a lot longer than expected to impliment the mechanics. The core mechanics include the ability to crouch, sprint, reverse time, grapple, teleport, slow down/ speed up time, pick up and drop items, inspect items and triple jump. The mood board below is a visual representation of how other games use these mechanics.



The mood board on the previous page looks at how the core mechanics in this project have been used in other games. The reason for looking at this is it gives information as to how other designers have implemented them and gives a better idea of ways they can be used in this project, looking at limitations and possible puzzles which can be created. It also shows that these mechanics are diverse in their uses and as they are used in some of the biggest games to have been created, it shows that they can be quite effective at being the core of successful games, such as Battlefield (crouch and sprint), DeadByDaylight (teleporting as the nurse), Just Cause, Overwatch and Far Cry (grappling hook), Life is Strange (rewinding time) etc. As these games are all successful using these core mechanics, putting them together in a game will create some interesting gameplay elements, challenging and fun puzzles and thoughtful landscapes for players to explore whilst using the mechanics.

MECHANIC PROGRESSION SYSTEM

Similarly to Super Metroid, players will gain more abilities/ mechanics the more progress and will teach a new ability once the player decides they have enough skills with their current one. One reason for this approach is that giving players all the mechanics at once may overwhelm them, so giving the player control over how long each step of the learning curve takes (self-regulating learning curve) gives the player more choice and allows them the freedom to go at their own pace. Players who take the time to master abilities, will be more efficient at the final tower, where the player will only have one chance to complete it.



MECHANICS TO SELL GAME

Showing the players early on why the game is cool and how they can use the mechanics will grip players and keep them interested in the game. Giving them the mechanics in stages will keep the game feeling interesting, fresh and unique, due to the new aspects.

GIVE CHOICES THROUGH MECHANICS

Make sure that the mechanics in the game give the players more choice and trust players to think past the choices and orders provided to make choice on own. However, have to make sure there is something there for players to discover if they do make those choices, for example, if the player gets the crouch mechanic and goes into a gap in the open world space to find nothing there, they will be disappointed. Need to think what else players may want to do in that moment. This is where easter eggs can be important, as players may think outside the box whilst using the mechanics and discover something which nobody else has, leading them to feel clever.



HIDDEN GAME MECHANICS

Another way to make the player feel fulfilled is by using hidden game mechanics. When designing a game, design it thinking of player's mindset and perception, as these are usually flawed so are likely to lie to the player, meaning games can give a false sense of empowerment or tension, for example, the last 10% of the player's health could go down half as fast when they take damage, giving the player a chance to bounce back and come out of the encounter feeling like they have overcome the odds and should be dead but their skill kept them alive, when in reality, it was an illusion to make the player feel more fulfilled. Some examples of this include:

- Bioshock: Enemies always miss player first time shoot so don't feel unfairly ambushed.
- Kiodi time: Gives slightly longer time to jump after go over edge- allows to keep flow and fast pace.



VIRTUAL ECONOMY

Even though this project will only have a basic economy, it is still good to research them to get some ideas and techniques. The developer needs to decide how much money should be in the world and ways it can be managed.

- Inflation: Demand goes up, need supply to meet it.
- Progression: Grind to get more of what want, e.g. currency.
- Gating: Limiting the amount of currency can get in areas.
- Value: How much think it should be worth.
- Cost: How much actually buy for. Need to balance amount of currency to the amount of goods available (unless it's a choice).

Use the currency to make interesting choices for the players.

7 MECHANICS: JESSE SCHELL

Mechanics can fall into different categories such as:

- 1) Time (continuous/ turn based/ Discreet).
- 2) Objects, attributes and states (current/ dynamic).
- 3) Actions (What player can do), e.g. Jump, shoot, pass.
- 4) Rules: Make use of all other elements by creating a goal.
- 5) Skill: Physical, mental (reflex/ logic) or both.
- 6) Chance, luck, probability- most games contain elements of chance and randomisation, however, the best player will usually win through skill.
- 7) Space: Continuous (open world)/ Discreet (can be nested inside a continuous space).

Knowing these could help deliver better created mechanics or give more ideas into how to manipulate mechanics to create a more unique experience.



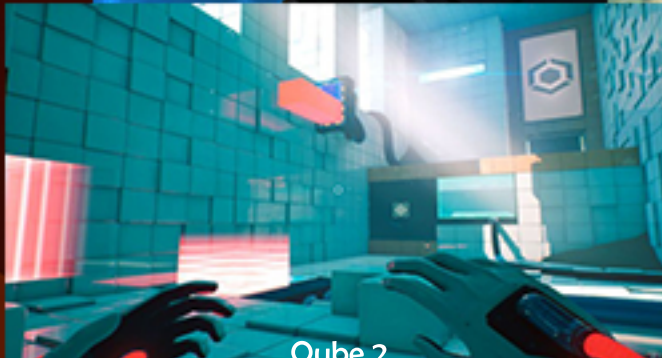
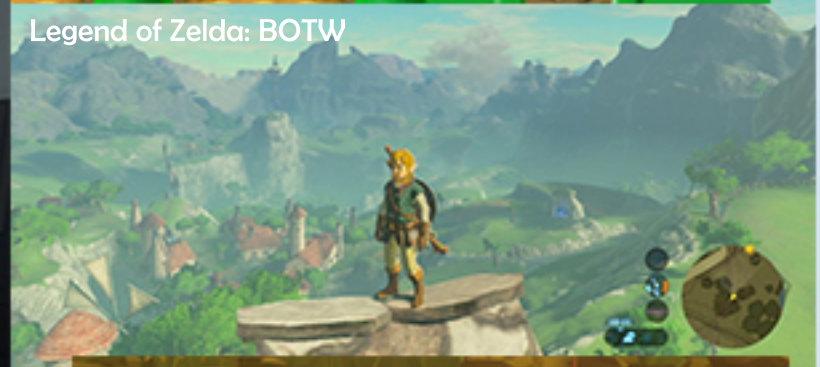
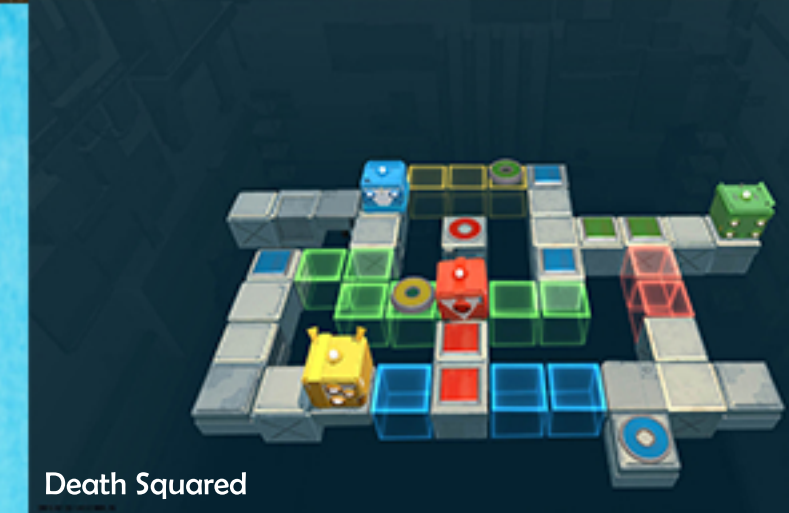
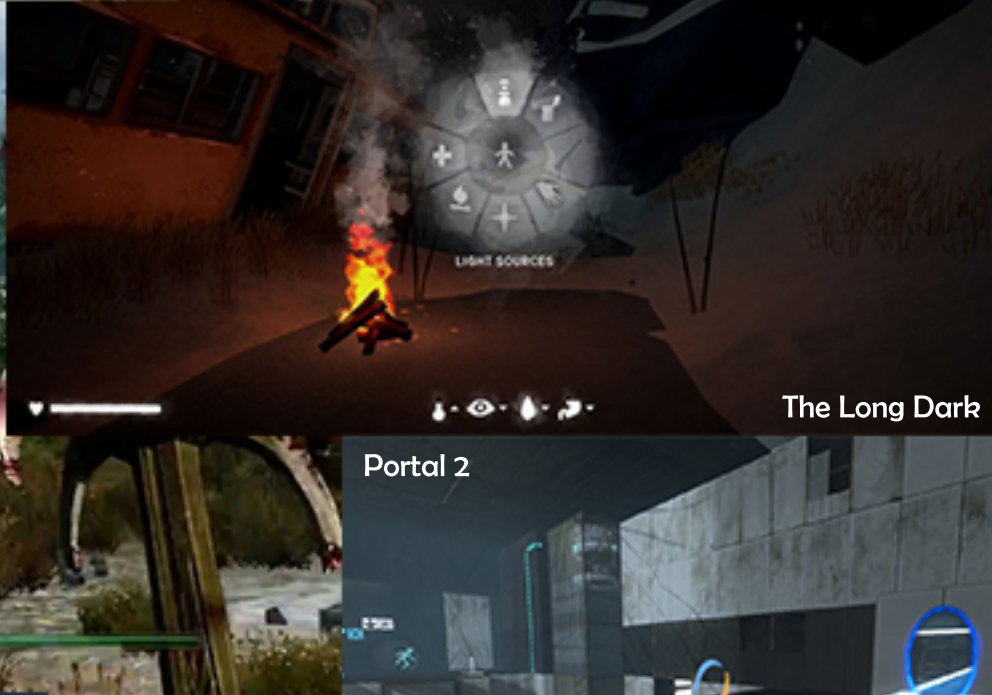
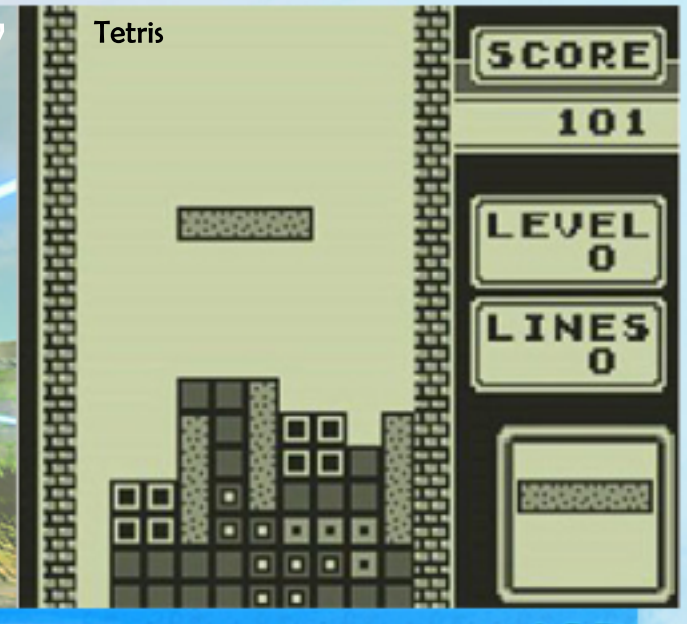
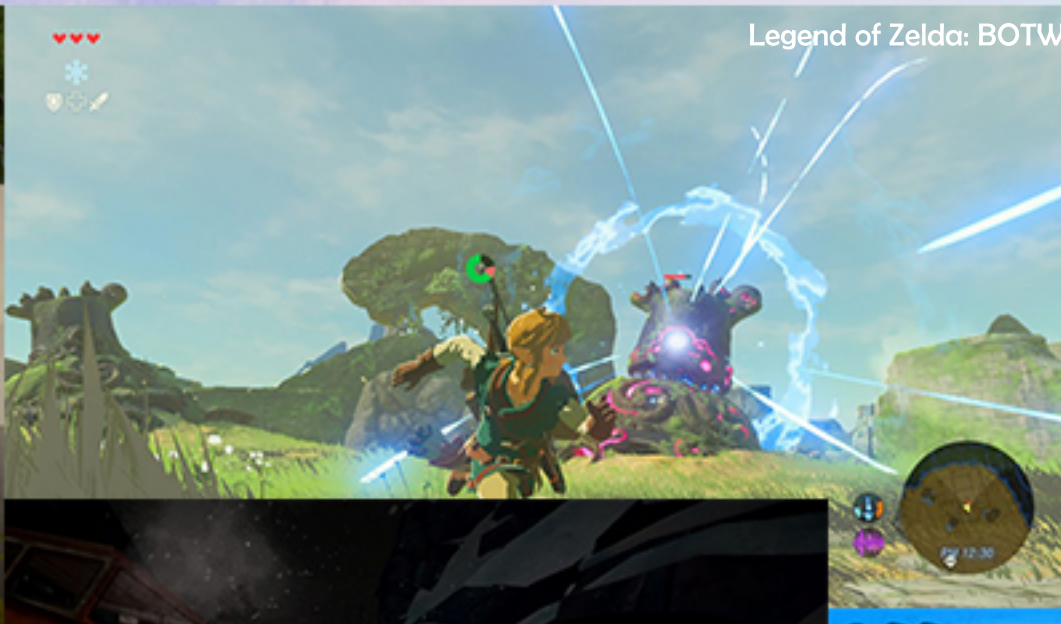
MARGINAL MECHANICS

Marginal mechanics are mechanics, abilities or items that have high utility in marginal cases. The 2 types include:

- 1) Specific case marginal mechanics- These are mechanics with an specific instance in mind, e.g. using a poison potion on a boss with no poison resistance for the best effect or a weapon with a specific perk against a certain enemy (e.g. more powerful).
- 2) Combinatoric marginal mechanics: Mechanics which are more powerful with other elements, e.g. with the right abilities, stats and gear, will give an advantage over other abilities. For this project, it could be combining abilities to reach a new area.

Level Design research: UI

Although the UI integration will be later in development, it is a good idea to have an idea of what the final product will look like from the beginning of production. Without UI, the game could become very confusing for the players to know how to play the game and thus, will become frustrating for them, which needs to be avoided in order to keep the players interested/ playing. In terms of the puzzle game reference images below do not seem to hold a lot of UI aspects to them, mostly teaching the player, before using pop up widgets to remind the players of key elements, however, the open world images contain more UI, so this research will help aid how much/ what UI should be used in this game.



UI

The UI mood board is a visual illustration of the user interface in different games, looking at the UI in both puzzle games and open world games, in order to get reference to how I should make the UI in this project. What I found from the references were that the UI is very minimalistic with the puzzles and the open world references have a little more UI to it, including health bars, minimaps and navigational points. One aspect which I feel is a very nice touch is the ability to bring up the UI with a button press, seen in the Long Dark, as this allows the player to check the UI whenever they wish without having unwanted clutter on the screen. This is most likely the approach I will take, as it lets players who want to see the UI have it on their screen and the ones who do not want the UI on to turn it off. Giving players this choice gives them more freedom, meaning they can customise the experience a bit more and hopefully, enjoy the game a little bit better. As I want the experience to be one of exploration, the UI will be pretty minimalistic in order to give players the best chance to explore, without explicitly guiding them with UI or cluttering their screen with widgets, which could make them miss an important environmental detail, landmark or focal point.



UI RESEARCH

In terms of UI, the more cluttered the UI and screen is, the more data the player has to store in their memory, so ensure the UI is uncluttered and clear, only having necessary UI on the screen. Craft how the player learns game in a clean and efficient way, reducing the amount of data they have to know so it is easier to process the rules. Giving hints about the correct buttons early on can make the players remember them easier and faster.

Giving players more time to do calculations for meaningful choices, means less UI has to appear on the screen, as it will give players the time to think through their decisions and remember how to put those decisions into effect. The more complex the mechanics and choices are; the clearer the tutorial needs to be, however, this can be more difficult to craft correctly.

ACCESSIBILITY

For players with disabilities, larger text and accessible UI options (e.g. sounds for visual/ auditory impaired players) can improve the game and make it easier for to play, meaning more players are able to play the game and nobody will feel discriminated against. Another element to avoid for players with disabilities is button mashing, as this can be difficult for players with certain mobility issues, meaning a button press is a much better option.

Audio

Audio plays a big part in the emotional impact of a game, whether it is to evoke tension, happiness, sadness or just general background noise, conversation, sound effects etc. Some tips for how to impliment audio in the right manner include:

- Using modulators: These create different sounds when played, modifying the pitch and volume.
- Attenuation: Changes the sound volume and settings when attached to a sound cue.
- Concatenator: Allows for the creation of continuous sounds.
- Looping: Plays sound more than once.
- Falloff distance: The sound gets quieter the more distance the players walks away.

Some of the most successful themes have come from using a simple underlying melody, such as tones used in the old '80s music' themes, which companies such as Nintendo still use, before carefully adding more sounds on top of it. This is successful as it creates catchy beats which people cannot get out of their heads and thus, end up remembering for a long time, therefore, bringing nostalgia when heard again later.



Previously, games could only process 3 tones (1 chord) at once and could only use single notes/ single cords, meaning audio producers were forced to focus on the melody, meaning they had to make simple tracks memorable, e.g. Star Wars, Indiana Jones, Jurassic Park or Harry Potter. As human voices can only create 1 tone at a time (functionally), they can be useful to create iconic music, e.g. The Halo theme, consisting of a male voice chorus, allowing the creation of memorable, strong hummable melodies.

However, today games are far more flexible and can cross fade based on environmental elements, which can be matched to dynamics on the screen, giving audio clues to players based on the gameplay, e.g. when a killer is near in DeadByDaylight. The extra hardware power also allows added extra layers to be added to old themes, e.g. Mario/ Sonic, to keep the themes fresh and new whilst staying true to original memorable and distinct themes.

When placed into the correct environment, music can really add to the game and create memorable moments, bringing experiences and immersion of players to a whole new level. Music in games can also help players retain memories if the music is well placed, which can let players remember that moment when hearing it again or add to the experience whilst in it, e.g. players who sing along to Fallout's radio songs whilst playing, can end up remembering what they were doing the last time they heard the music, thus, they have created a memory.



Despite the game not having a traditional linear narrative flowing through it, there are still going to be a number of ways the narrative is illustrated in the game. Some of these include environmental narrative such as *Gone Home*, which has items that players can interact with to learn more about the story, world narrative such as *Far Cry 4*'s villages/posters and *Detroit Become Human*'s billboards, displaying narrative subtly in the world space and character narrative shown in *Octodad*. Other ways to show narrative include narrative through dialogue, bookended cut scenes, mechanics, paths/ signposting, notes, focal points and listening to conversations, all of which showing narrative in their own way.

Family

-Octodad-
Octodad is a classical family man, with a wife, two kids, and a beautiful suburban home. He is charming, sharply dressed, well-mannered, and all-around a good fellow. He is also secretly an octopus, a fact which he spends his every waking moment hiding. Unfortunately his body makes him very clumsy. Interfering with the mundanities of life on the surface. His secret nature requires him to live on the edge, constantly afraid of being found out by those who would return him to the sea. He is not above running from his problems, or lying and tricking his way around them. What could motivate him to struggle through the human charade? Simply the love of his family!

-Tommy-
Tommy is the ten-year-old son of Scarlet and Octodad. He is way into sports and athleticism, and he tends to act arrogant and brash, causing trouble pretty much anywhere he goes! Tommy tries to play ball with his dad, and goes on imaginary adventures with Stacy. He's always pushing his family to be the best they can be.

-Scarlet-
Scarlet is lovingly married to Octodad, and despite ten years with him is blind to his cephalopod secret. She works as a journalist for the *Timely Times*, and loves to uncover conspiracies. She tries to be a fun mom, while keeping the peace and covering for Octodad's messes. In her free time, she reads romance novels and watches the sky for aliens.

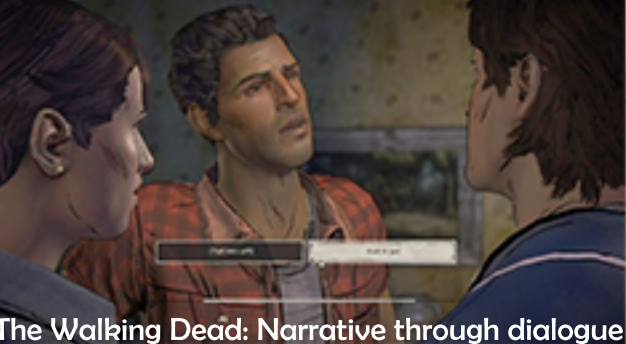
-Stacy-
Stacy is the eight-year-old daughter of Scarlet and Octodad. She is a whimsical child who is quiet, creative, withdrawn, and easily frightened. She has a clarity of vision unbundled by expectation. Stacy likes unicorns, wizards, birds, fishes, spaceships, and the power of love. She thinks her life is normal.

Octodad: Character overview



Peculiar Doll
A strange doll in strange dress.

There once was an abomination who had no place in this world. She clutched this doll tightly, and eventually was drawn into a cold and lonely painted world.

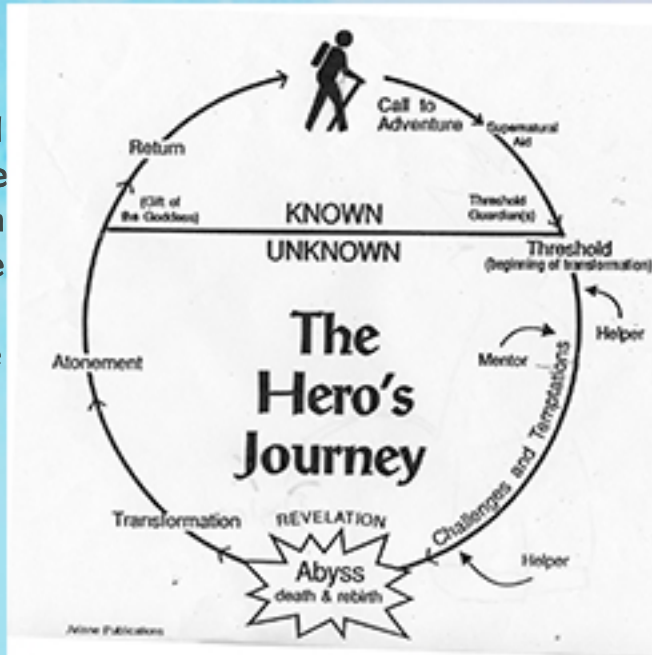


The mood board on the previous page featured images of different ways narrative can be integrated into the gameplay. It is important to look at this, as if the narrative is just spoon fed to the player in cut scenes, this can be very expensive to create and can become frustrating for players, as they are spending time watching the screen and not interacting with the gameplay, which is the main focus of a game over other forms of media. Using the environment, assets, notes, signposts, lighting and the world itself to convey the narrative, are good ways of keeping the player invested in the game, as they will be looking out for narrative details in the environment (if they explore) and will feel satisfied if they find new narrative. This approach of placing the narrative into the game world over explicitly telling the players (other than the big main plot points), allows players to forge their own path and only explore the deeper aspects of the world and world's narrative if they are interested.

THE HERO'S JOURNEY: JOSEPH CAMPBELL

This method is a very useful tool which will be put into use for this project:

- 1) Call for adventure: Star to follow (vision of goal), coming to awareness of objective.
- 2) Refusal of call: Hero's reluctance to go, empathise with character, has a personal life, not just an all powerful being.
- 3) Supernatural aid: Power or device to let them face trials ahead, but must fit into the world space and character, which gives a better look into the world (could be aid from God).
- 4) Crossing threshold: Travel from real world to magical world and can't return. This point could hold a threshold guardian: an entity tying together and separating both worlds.
- 5) Belly of the whale: Hero faces inwards and starts to understand the history and origins of the world (go up tower).
- 6) Road to Trails: Hero accepted and prepare for final goal. Begins with road of trials, could be literal trials to overcome before ready for conclusion of journey.
- 7) Meeting with Goddess: Comes to understand love of some sort (e.g. doing quests because they love the world/ characters),
- 8) Temptation: Allure of fame, power, sex, money to divert hero from quest, some temptation to get players off main quest line to overcome, e.g. money, side missions, exploring etc.
- 9) Atonement with the father (entity): Confronting/ reconciling with the entity as an act of faith.
- 10) Apotheosis: Total abandonment of the real world, transition into something more allowing the character to achieve more depth/ they are visually reborn.
- 11) Return: Return back with new knowledge for the good of society.



3 PILLARS OF GAME WRITING

- 1) Plot: storyline of piece, at most simple form/ layer. Be the story not seen before, have twist or something to say- mixed into mechanics e.g. breaking rules in papers, please.
- 2) Character: view character's lives, narratives, emotions, views and make them have a personality and feel holistic. Can often come at expense of plot if it is about characters over the world.
- 3) Lore: everything that makes world feel vibrant and alive, makes feel like existed long before the character got there and exists outside of player character.

HOW TO DELIVER THIS WELL

Things to consider in order to make a living, breathing world with dynamic characters include looking into the level design, mechanics, combat design etc. The space should fit with the lore and mechanics, with everything having a purpose, for example, an old castle should have a reason for being built, with an idea of who owned it, how it was constructed, why in this location? This needs to be consistent. As a designer, you need to know the world inside out and understand everything's place in the world.

In terms of level design, the levels should be well planned out and researched, the player should always be led through some sort of signposting, the scenery should vary and the players should be rewarded for exploring it, otherwise, they will not find a purpose as to why they are playing it. Testing the level is also a huge part of seeing how well the game works.



EXPOSITION

Exposition is another big reason as to how a game can be delivered well, having a bookended experience or explanatory text can set up the backstory on the setting, rules of the world etc. However, ensure to avoid exposition dumps, as players could get confused or feel lost if they are given a lot of text at once. Make sure every line tells something about the world, character, lore or plot and says something important, otherwise, it's not useful.



NARRATIVE EXPERIENCE

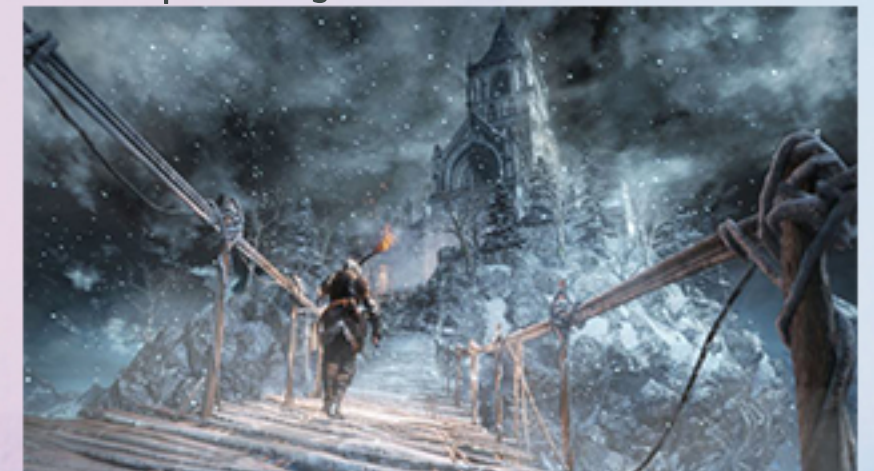
The Hero's Journey and interest curve are frameworks for change in a narrative experience.

When adding, removing or modifying elements, new isolated and associated meanings are developed and fed to players.

These variations combine together to create unique dynamic meaning, which links everything together, e.g. talking back and changing experience based on players thoughts and experiences.

These variations could come from the player learning about the game over time, mastering new techniques or changing player experiences in the game, which can be used to discuss sensitive subjects or help find the joy in sensory experiences.

The mix of all these can be a very powerful way to relay a message. The game will speak to players and the dynamics change what that message is, what is being said and how they see the world post change.



Here is a list of references to the links I have used for this research document, in the pre-production document and in order to gain the information I need to complete the tasks up to this point. In time, these links will be changed into APA style.

- <https://m.youtube.com/watch?v=8AhY7CUbzwc>
<https://m.youtube.com/watch?v=OUBNXneL1oo>
<https://www.indeed.co.uk/m/viewjob?jk=53b89a9ccae186ec&from=serp>
<https://m.youtube.com/watch?v=NoNbY0IJFM8>
<https://www.giantbomb.com/sprinting/3015-603/>
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<https://www.quora.com/What-was-the-first-game-to-introduce-the-double-jump>
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<https://www.gamesradar.com/top-7-greatest-uses-time-control-game-mechanic/>
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