UNIVERSITY OF ULSTER

SCHOOL OF CREATIVE ARTS

DES-518 M2: MAJOR PROJECT REFLECTIVE STUDY

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‘BOUND’: A 2.5D PLATFORM GAME

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Signed ……

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1. ABSTRACT

For the final project of my degree, I sought to create a videogame demo that would be free for players to download online, and would be used as a starting point for either starting my own business, or attracting the attention of industry employers. The game known as Bound is a 2.5d platformer created in the Unity Engine, using 3d assets created in 3d Studio Max.

The design process would put to good use all of the skills I had acquired during my 3 years studying at the University of Ulster including 3d modeling and animation, graphic design, colour theory and illustration, as well as the learning of a few more, including handling the Unity game engine, scripting in C# and taking the first steps in promoting the final product.

This report documents the creative process of taking a videogame from concept to execution, discussing factors including research, concept and story creation, asset development, scripting, marketing and level design. Examples from the various stages of work are included in the appendices as an accompaniment to the main text. Also included is an evaluation discussing the success of the project as a whole and how the game could be improved or expanded upon in future.

2. INTRODUCTION

2.1 About the project

Speaking at the Eurogamer Expo in 2012, Valve's Chet Faliszek answered the most common question heard by industry professionals:

“How do you get yourself a job in the games industry? This is the answer: you just give yourself one. It's that simple.”

He continued:

"People have made some of the dumbest, stupidest things that have made us laugh, that we've passed around, then we started talking about them,"

The purpose of this project was to create a videogame as a portfolio piece and a way to (hopefully) get the attention of employers in the games industry. Putting into practice the skills I had learned in the first two years of my degree, as well as learning a few new ones along the way.

With the proliferation in the last five years of high speed internet, mobile gaming and digital distribution, there has never been a better time for independent developers to enter the games industry. Ireland has a growing development scene and the previous barriers to entry are now all but gone. Without needing to rely on publishing deals or high end production equipment it is possible for even the smallest team to develop and sell a marketable product with little more than a laptop computer.

The game I sought to create stemmed from a few rough ideas made years ago where a lone figure wandered an abstract landscape. Exploration was the primary goal, and everything was rendered as a silhouette. I decided ahead of time that my final degree project would be the perfect opportunity to bring these ideas to life. During the course of this project I was tasked with making much clearer definitions of the setting, environments and gameplay, then bringing them to life.

Bound, as it would come to be known was so named to suggest exploration of the unknown whilst also alluding to the main gameplay hook of leaping great distances.

Despite having a background primarily in art and design, the other key component of this project was programming. In many ways programming is the more vital element – games live or die on how well they play – attractive graphics are just icing on the cake. So as well as creating the art assets, a large portion of my time was spent learning the C# scripting language. This would give me a more rounded set of skills with which to create my own games and therefore attract potential employers.

The game will be created initially as a demo for grading purposes, and beyond graduation may be expanded into a full release. The scope of the project means that to create the full game in such a short space of time would be impossible, and may require several months of additional work following the project deadline in May. As a result, the submitted work should be fairly indicative of the final product, containing key gameplay features and a fully developed art style.

This report documents the creation of the game from concept to release, highlighting the design and production processes. A brief description of each process is accompanied with examples of created work in the appendices, including concept art, produced assets, in-game screenshots, and design inspirations.

2.2 About the game

Bound follows the adventures of Joot Lightray, a down-on-his-luck space explorer who gets stranded on a strange alien planet. With no chance of rescue he must search for a way to get off the planet himself. The planet is home to a rare mineral called gravitite which powers much of the machinery, is present in animals and plants, and can give the user control over gravity.

Played as a 2.5d Platform Game, the gameplay involves Joot exploring several levels, collecting power ups and weapons which will allow him to access new areas and fight the monsters that he encounters.

Rather than follow a linear path where level one is followed by level two and so on, Bound features an open explorable world where the player can go anywhere so long as they have unlocked the correct abilities to get there- for example one section of the game world might be blocked off until Joot has gained the ability to glide across wide gaps.

The game utilizes a silhouette art style where the player and all foreground elements- monsters, platforms, terrain etc are rendered primarily in black, whilst the backgrounds are a bright colour. Selected detailing is also created with the use of an electric blue – this is used to signify the presence of the mineral gravitite, and its presence indicates something of importance, be it a power up, enemy or switch that can be interacted with.

Although movement is on a 2d plane - players can only move up, down, left and right - all of the assets are created in 3d. This allows for smooth animations and realistic scrolling backgrounds and perspective effects not commonly seen in the silhouette art style.

Much of the exploration is enabled by the collecting of ‘gravity shards’, a power up which when collected will increase you jumping height ever so slightly. Unlike other games where collectables such as coins merely increase your score or add lives, these gravity shards have a more direct effect on gameplay. Further unlockable abilities include a jetpack which allows for jumping in midair, and glide boots, which slow your descent when falling. The player can also collect a whip which which to attack enemies, and a gun to attack them from long range.

The gun is not meant primarily as a combat tool. In keeping with the narrative, it s main function is to affect gravitite found in the environment. It can destroy certain blocks to open new paths, illuminate lanterns, activate switches. It is more effective at killing native fauna (which contain gravitite) and virtually useless at killing alien enemy soldiers who later follow Joot to the planet.

The game demo in its current state is completed when Joot finds a gravitite power core and then returns to his ship, enabling his escape.

Full controls for the game can be found in the Appendix section 9.10

3. AIMS AND OBJECTIVES

In taking on this project I had several goals in mind, both technical and professional. These are listed below:

Professional:

-To take the knowledge and skills gained so far in Character design, 3D modelling and animation, and put them to use in creating a final showpiece.

-Create a functional, working game demo containing assets of satisfactory quality for following up with a sellable product beyond graduation.

-Create and animate a main character, a handful of enemies and a single demo level demonstrative of the final game.

-Use this demo and related development material to create a public awareness/hype for the game when released following graduation.

- Create a portfolio piece that would grab the attention of potential employers.

Technical:

-Gain experience using the **Unity** game engine, with a focus on learning scripting in the C# language.

-Further my experience with 3D programs such as **3D Studio Max**, **Z Brush**, and other relevant programs and plugins.

Why were these my particular aims? I've always enjoyed playing and making games, having used several pieces of hobbyist software in the past, such as **Game Maker**, **RPG Maker 2000** and **Adventure Game Studio**. The purposes of such software is to create a framework or 'Engine' on which the developer can add assets such as character models and code scripts to develop games without having to get bogged down in the nuts and bolts of computer science. Whilst these products were suitable for solo development and small scale products, they are limited in their application and offer little in the way of employable skills. The Unity Engine, now in its 4th version, has rapidly become the go-to game engine for developers both large and small. With robust capabilities available in a free to use software package, developers can create professional quality products with a production pipeline similar to that of the largest game studios. As such, for a student wishing to break into the games industry, learning the Unity engine is the perfect entry point.

4. RESEARCH

The research phase of this project ran concurrent with the production phase almost all the way through. Whilst research was the first thing to be carried out, the broad range of tasks I had to complete meant there was always something new I had to learn- whether it was researching botanical fungi to create in game art assets, watching hours of tutorial videos on learning how to code the main characters animations, or simply just sitting back and taking inspiration from the great games that other creators had made.

Most of the research was hands on- practicing tutorials or playtesting software, and very little came from traditional literature sources. The exception was in using reference from textbooks for the character animations. For this I used two books- 'Timing for Animation' by Whitaker and 'Tezuka School of Animation Volume 1' by Tezuka Productions. . Elsewhere, online essays and and articles on game design were read which helped inform the design of the game.

Please refer to the Bibliography for further information regarding these books and essays.

4.1 Taking Existing Games as Inspiration.

Both the silhouette art style and the action/exploration genre that I was aiming to create are well established in video game culture. As such, I had a wealth of examples from which to draw inspirations. Independant games such as **Night Sky (2011)** and **Limbo (2010) are** perfect examples of the powerful aesthetic possible by merely using silhouette. Of particular note was how two visually similar games could evoke such different emotional reactions from the player. Night Sky with its crisp graphics and tranquil soundscape serving to relax the player, whilst the grimy, foggy visuals of Limbo, it's placing the player in control of a small, virtually powerless child , and its reliance solely on industrial clanks, weather effects and atmospheric sounds serve to create a relentless sense of foreboding and peril.

I intended to create a more fast paced, adventurous game that still retained a slight sense of melancholy, so these games were good examples of the two ends of the same spectrum, and what I should aim for to best create the specific mood I was looking for.

Meanwhile, the classic games **Super Metroid (1994)** and **Castlevania: Symphony of the Night (1997)** are genre defining examples of non linear progression in platform gaming. Even decades after release they are lauded for their wonderful sense of atmosphere and world building, and cited as the grandfathers of the genre as it exists today. I used these as reference for successfully implementing the system of collecting different power ups to allow access to different parts of the game world.

Shadow Complex (2009), is a more recent evolution of the two games mentioned above, using the framework of a 2D exploration platformer, but with fully 3d art assets. This was useful in assessing the possibilities of combining the two- which I would be aiming to achieve myself. In particular, this game highlighted some of the artistic possibilities (and perils) of having a perspective enabled camera, something which is relatively unseen in the silhouette subgenre.

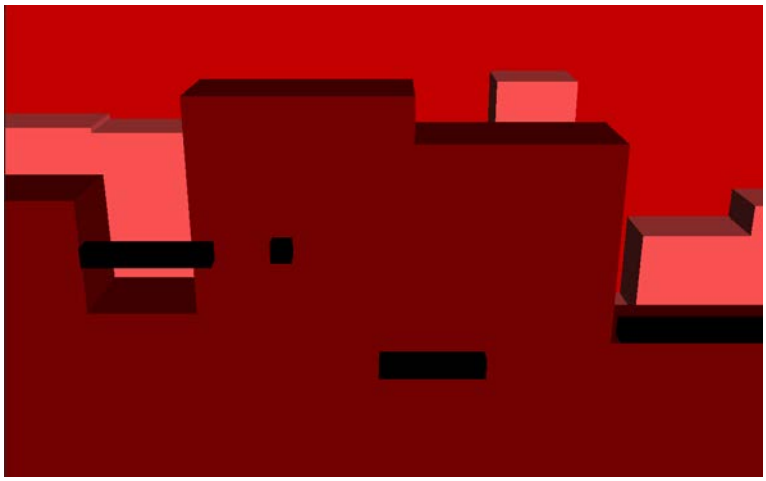
Having been a long time gamer myself, there are countless other games that helped inspire the creation of this one- whether through gameplay, or showing how an artistic idea could be carried out. Relevant examples include **Viviscape, Lunnye Devitsky , Cave Story, Dust An Elysian Tail**. Please refer to the bibliograhy and Appendix section 9.9 for more details on the games listed and their respective creators.

4.2 Learning How to Create My Own

I was fairly familiar with most of the tools used in this project- I was able to rely primarily on my own previous experience with software such as 3D Studio Max, Photoshop and to a degree Unity itself. However a huge portion of my research time was spent learning the Unity scripting language C#. I used a variety of sources to help get a grasp on the language. My first stop was to watch the Unity video tutorials available on the Unity homepage. (UNITY TECHNOLOGIES 2013)This gave a basic grasp of how many of the functions work.

Next, I downloaded a pre existing 2d platformer package from the Unity Asset store which contained sample scripts for character movement. I dissected this code to see how it worked, and incorporated much of it into my own character.

I used several online tutorials from www.catlikecoding.com (CATLIKE CODING, 2011) to create very basic programs- a clock and an infinite runner game which gave me a firmer grasp of how scripting interacted with the assets in the unity engine. Although neither of these were particularly relatable to my platform game, they still gave me experience with common functions used in C#.



As the project went on and I started coding, I encountered various challenged in which the only solution was to ask questions or check coding forums online. The Unity forums (UNITY TECHNOLOGIES, 2013) contained an archive of questions from fellow coders who often had issues similar to my own, and often provided the answers I needed. I was also fortunate enough to have a few professional contacts in local games studios to whom I could approach when a particular piece of code was giving me problems. With their experience I could show them my incorrect or incomplete code, and they could give me examples of how to fix it.

4.3 Colour Theory

To create the game's unique visual style, I wanted a flat graphical look for all elements. This involved using unlit texture shaders in Unity which didn't display any shadows or highlights from in scene lights.

At the start I just threw in random shades of red and blue for prototyping. However, as time went on I had to adjust the shades to make the interactions between colours more harmonious. In an early display to classmates, the brightness of the blues and reds fought with each other, and many complained that it was difficult to look at for any length of time. As you can see in Appendix section 9.3, variations in the red shades provided different moods, some of which were undesirable- too unsaturated and it looked pink, to bright and it hurt the eyes. I settled on a highly saturated red with a K value of around 20% to dull it down so as not to fight for dominance with the bright blues, whilst still being bright enough to make it stand out against the black of the foreground.

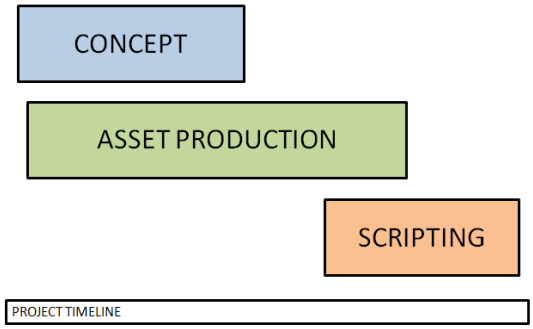
Another issue that presented itself was in the creation of the midground layer. This layer serves the purpose of creating a sense of depth and perspective, whilst also containing 3d objects and landmarks to help the player navigate and get subtle narrative clues. I chose to display this as a dark red that gets lighter the further it recedes, utilising Unity's fog feature to create atmospheric perspective. The problem was that the parts of this layer closest to the player were too dark. Whilst the blue detailing of the player maintained his visibility, distinguishing mid-ground detail from foreground platforms became difficult. The solution to this was to again eyeball a series of different shades and test them with others, picking the shade that most could agree was the most favourable.

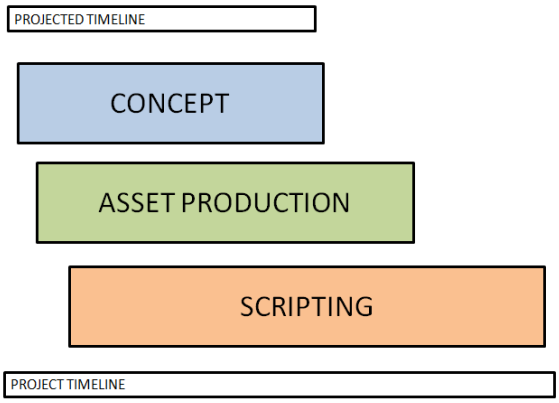
5. DESIGN AND PRODUCTION

5.1 Time Management & Schedule.

Knowing that I had an incredible amount of work to complete, I knew that time management was a vital factor in completing this project successfully. There were a large number of separate tasks, many of which were dependant on the completion of each other. For example- I couldn't code the player character until I had finished modeling and animating him. I couldn't create levels until I had first coded the movement script, etc.

At the start of the production I created a very simple Gantt Chart (shown left, below) showing the estimated time period I would spend on each aspect of production- Concepting, Scripting and Asset production. I had thought about leaving the scripting until towards the end of production, when all of the concept artwork and most of the assets were created. However, I realized that I would need to spend a lot more time scripting than first realized, particularly in learning the scripting language. This led me to reconsider my time in the chart shown below right.





In terms of making working prototypes, it was better to create and script individual assets as I went along, rather than wait and leave everything to the end. This way, even if for example, movement wasn't completely coded, I could still check that the ammo and health systems worked.

I finished the concept stage early in the project as expected, but since the levels could not be completed until all of the player script was completed, asset production would continue until virtually the end of production. Certain aspects of asset production- such as non interactive background elements and props were regarded as low priority and deliberately left until the end of production when all of the more critical elements such as movement scripting and character modeling were completed.

5.2 Scope of Production

I had to make a few firm choices from the outset regarding what would and would not be part of the finished project. With time being limited, every task had to be justified and then budgeted for time.

I wanted to include a functional menu and opening cutscene, but compromised by excluding additional features such as a map or in-game menu system. Whilst vital features in most game releases, I reasoned that given the small size of the demo and short length it would take to complete, they could be sacrificed.

When creating enemies, you must sketch, design, model, texture, rig, animate, script behavior, and then insert into the game. This takes a lot of time to do, and with such a wide range of other tasks to complete I decided early on to create a small number of simple enemies for the purposes of this demo. I also decided to limit the number of levels to a maximum of three- assembling the assets into a successful level is an iterative process of trying something out, refining it and trying it again until it is challenging, enjoyable and bug free. As such iterations take time I had to reduce the size of this task in order to fit it in alongside everything else.

One area that I did not want to limit in scope was the interactivity with the player character. I decided it was important to create the full range of animations and gameplay required for the player, even if it was to be in a smaller play area. I reasoned that taking the game forward as a full fledged product would be easier if the main challenge was implementing additional levels as opposed to changing core gameplay.

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5.3 Choice of Platform.

I decided that I would focus on developing the game for Windows PC platforms. Developing for the variety of screen sizes and resolutions of the Android Mobile platform would require me to dedicate a significant portion of my development time, and building for Apple devices requires the purchase of additional licenses. Additionally, development for touch based platforms would require the design and creation of additional user interface assets, adding to an already large list of tasks needing to be completed for this project.

5.4 Setting and Story.

One of the first things I wanted to finalise was the story and setting of the game, as I felt that this would dramatically inform the gameplay. My personal philosophy is that the lore and gameplay of most games should complement each other, instead of simply existing independently. There are exceptions of course- we don't need to know why Mario can jump so high for the gameplay to be good, but in more story driven games I consider it vitally important. Knowing that the main gameplay feature would involve the player being able to jump higher and higher as he collected powerups, I tried to think of ways this could be incorporated into the story. I settled on the concept that the collectibles, known as 'Gravity Shards', contained a rare mineral known as Gravitite– found only on this planet and holding gravity defying powers.

At this point I was already sketching furiously in my design sketchbook- the concept art organically becoming part of the writing process. This in turn helped further define the story- the main player

character, Joot Lightray is a scout for an unscrupulous mining corporation, who are at first dismissive of his crashing on an alien planet, only to quickly come running when they think there could be profit involved. I thought that down the line, with more time to spend these story seeds could be used to touch on real world issues such as environmentalism and corporate crime.

The atmosphere I had envisioned to create was one of loneliness and isolation- the main character would be exploring this world finding the ruins of long dead civilizations, searching simply for a way to escape. As I continued drawing and writing however, I found that I wanted to give the character a voice, and be able to explain the world around him to the player. For this I created his AI companion, known simply as Computer. Computer would be able to scan and analyze the relics and power ups Joot finds along the way, explaining how to use them, whilst also providing conversation to help further the story at key points.

I wrote a brief script to convey the story which can be found in its entirety in appendix section 9.5

5.5 Concept Artwork

As mentioned, the concept art phase was being developed in tandem with the setting and story. When I started, I had no idea what the characters or the world would be. I started with a few quick sketches of what the main character might look like, which I then posted to Facebook and asked others for their feedback. After about a dozen drawings I had the basis for my main character, from which everything else could be built around- for instance, a tall thin humanoid character will exist in a different world than a small blobby cartoon character.

Next, development of the world itself was centred around the question- if an incredible element such as 'gravitite' existed, how else would it affect the planet and its native flora and fauna. As mentioned before, I reflected on my prior knowledge of how life evolved on our planet to inform how it may have adapted the one in the game. The more I pondered and sketched I realised that the plants would utilise it to fly their spores further for pollination, or to attract insects by its bright blue colour.It could possibly draw it in at the roots to allow them to grow taller. The natives would use it for flight and transport, and possibly even as a power source. This kind of thinking helped develop the enemies and props that would appear in game. It also helped define why the player would have to traverse particular environments- for example the caves would be a source of gravitite, full of mining equipment, and the industrial level would perhaps be a refinery or power plant. Elements such as stairs and walkways which are commonplace on earth, might be unnecessary on a planet where people can routinely cross several dozen feet in a single bound.

Please refer to the Appendix section 9.2 for examples of concept artwork.

5.6 The Comic Book Elements

I had to find a quick but effective way to set up the story in this demo. Ideally I would have animated a whole cutscene using the in-game assets, but this would have taken a prohibitively large amount of my available time. As a result I needed to find an alternative. I work part time as a comic book artist for a company who recently used the Unity Engine as a means of creating interactive digital comic books. I applied the skills I had acquired from there to create a similar style for the opening cutscene. This was use to establish the tone of the script which would carry on throughout the

game, and to set up the scenario that you played a lone scout who had crash landed on a mysterious planet.

The comic book panels were drawn by hand then scanned and coloured in Photoshop. They were imported individually into Unity and then animated. It should also be noted that the decision to use comic panels was result of a conscious decision to have this product show my full range of skills and abilities.

The colour scheme of the comic panels was intentionally more colourful than the main game, in order to suggest the alien, unfamiliar nature of the planet that Joot lands on. As the comic continues, the panels get more predominantly red to transition into the game.

Please refer to Appendix section 9.6 to view the comic panels.

5.7 3D Modelling

Much of the 3D modelling was done using techniques I had learned in the previous two and a half years of my degree- modelling, texturing, skinning and rigging. By far my least favourite part of this process is texturing, and fortunately the silhouette style I had chosen for the game allowed me to minimise the time spent on such. Many of the objects in game were created as simple low poly geometric shapes clad in one solid colour. Less time spent texturing meant more time was available for modelling. This allowed me to create more and more assets to help bring the world to life- fences, plants, wind turbines, streetlamps- all created to give the alien planet a sense of identity, as well as visual interest to maintain the players attention.

For the main character Joot, and his primary antagonists the soldiers, I used zbrush to create simple body shapes, which were then taken into 3D studio max for further work. I wanted to use ZBrush both to gain familiarity with the program (rapidly becoming a key skill among comtemporary 3D Artists) and because it would be faster than modelling directly into Max.

I had some troubles importing animations into Unity, which doesn't support vertex animation functionality available in 3D Studio Max (i.e. animating individual vertices directly, as opposed to animating bones which the vertices are 'stuck' to). Fortunately this only accounted for a small percentage of my animations- the rest, whilst fairly time consuming, were easy to import. One of the biggest challenges was identifying the entire range of animations to be created, then syncing them correctly. For example, Joot can run, jump, freefall and stand idle. He can also shoot his gun or swing his melee weapon from each of these positions, meaning individual animations had to be created for each and every movement combination!

The enemy NPCs (non player characters) were much easier to animate, requiring far fewer animations each- merely a walk, idle, attack and death animation for the majority.

Please refer to Appendix Section 9.3 for examples of the 3D modelling process.

5.8 Scripting

By far the biggest hurdle in production, and also my biggest learning objective was in code scripting. To create early prototypes of the game, I used pre-existing code for the character, which I adjusted slightly to use my animations. This wasn't ideal however, as it didn't allow the full range of gameplay options I wished to incorporate. The player character was the most difficult and complex component to script, with thousands of lines of code altogether. Since this would be the most difficult, I decided to tackle other simpler parts of the game first to get more comfortable with the C# scripting language- aspects like changing health and ammo counters, or loading between levels which would only require a few lines of Code.

Fortunately I was able to receive some mentorship in the scripting from the coders at Troll Inc, a local games studio with whom my employers share an office. In the plentiful instances of my code not working correctly, they were vital in helping me identify and solve errors and bugs.

For the comic cutscene I decided to use a plugin for Unity called Playmaker, which uses a simplified scripting interface useful for creating animated sequences. Whilst too cumbersome for features such as the player character, it was superior for this task. I didn't want to rely too heavily on Playmaker though - with scripts often referencing each other I didn't want a random mix match of Playmaker and C# scripts.

Please refer to section 9.8 for sample C# scripts.

5.9 Creating Levels

Knowing that I would not be creating a full game per-se, but still including many of the gameplay systems, I decided to create a small 'micro-world' indicative of the final product. This consisted of 3 zones- Jungle, Caves and Industrial, in which the player could traverse and gain abilities to continue exploring. These would be created to demonstrate all of the games systems over a short timescale. I first created a paper version of this micro world, where I had to create a progression path for the player- i.e. player can't reach point c until he has collected the jump upgrade at point B. I started with post-it notes containing individual rooms and geography elements that i wanted to include, then followed this up with a large hand drawn map, including an arrow line indicating player progression.

As the world is open and non linear, a certain amount of backtracking is carried out going between locations. It was important to keep up the player's interest during these periods, so alternative routes were created over familiar ground as the players gained new abilities- A simple example being that on the way to a location, the player might have to run through a house, but on the way back, he could jump higher, and then return via the rooftops instead.

Much of the level design was done in conjunction with the concept art phase. With the limited use of colour it was important to be able to distinguish between the 3 distinct areas. As such a large number of 'props' were created as stage dressing- trees, streetlights, gas pipes, stalactites etc were all modelled to give the levels a unique identity.

Please refer to Appendix section 9.2 for sketches and drawings from the level design phase.

5.10 User Interface Creation

For several reasons, I wanted a very simple, minimalist user interface. First of all, I didn't want to clutter the visuals with lots of extra information- secondly, as mentioned before, the more complicated the interface, the more time and scripting it would require. I settled on a simple interface showing the 3 player stats – health, ammo and collected shards. These were given simple representative icons and numerical values. I tested various sizes and positions on screen which would look most intuitive and easiest to visually scan whilst playing.

One feature I wanted to include was representing the player character's power ups visually as the game progressed. Rather than creating a menu system showing acquired power ups (which again would have taken up lots of extra time) I made them visible on the player character once they were collected. Visually this was very attractive, as it added new nuances to the player animations as the game progressed, keeping things fresh and exciting for the viewer.

A small but important Interface feature I decided to include was the ability to skip the opening cutscene. In his 'Bad Game Designer, No Twinkie' articles posted online (Adams, 2011), Ernest Adams lists many features which can make or break a good game. Whilst many weren't applicable to my game, one common complaint with players is the inability to skip cutscenes, especially if they have already been seen. Due to its short length and my decision not to implement a save load system in the game I realised that many players might be replaying the game from the start more than once. As such I allowed them to skip this cutscene to get straight to the gameplay.

5.11 Music and Sound Effects.

I commissioned a friend of mine, Albi Beshi, to create the music tracks for the game. I am not skilled in making music so this was one aspect of production I had no choice but to outsource. I asked for 5 tracks, One for the title screen, one for the opening cutscene, and one for each level. I wanted the music to be fairly low key, providing an ambience and atmosphere to the game, without overtly drawing attention to itself. The tracks were designed to be fairly short, at about one minute in length, and to loop together. The short length was required to keep file sizes small. I included Albi Beshi's name in the opening credits of the as he is the only person other than myself to create content for the game. He released the Bound OST on his Soundcloud and Itunes profile, which provided some extra promotion for the game.

The sound effects were created with a little sound generator program called Sfxr. This program generates random sound effects which you can then alter with a variety of sliders. It is suitable for simple sounds and would suffice for my purposes. I made a list of about 30 sound effects needing to be created, ranging from jumps, to gunshots, to menu selections.

Please Refer to Appendix section 9.7 for screenshots of this program.

5.12 Playtesting

The Unity engine allows you to enter 'Play mode' at any time, letting you play your game in its current state with just the click of a button. This allowed for a rapid iterative cycle of creating, playtesting then tweaking at any time, and was vital in quickly making features playable.

Later, when the game was closer to a finished state, it was important to let others play the game to see if they could play through the game without any external help. When developing the game you tend to know its inner workings too well to play it objectively. Knowing the locations of all enemies, powerups etc means you will never play through it the same way a new player will. This was therefore the best way to check that all levels flowed together correctly, power ups were easy to locate, navigation was intuitive and most importantly that the game was fun!

5.13 Marketing and Promotion.

There's no point making and selling games if no one knows about them! About halfway through development I started the marketing push to make others aware of the game. I started by showing development photos on my own Facebook and Twitter feeds, as well as a studio page I had set up previously on Facebook. The intention was to use this page- known as **Shark Tank Studios** as a company brand for all of my ongoing development projects. I had previously used this to showcase work including CD artwork designs and gig posters, and as such it already had a small following. With the possibility of developing the game further beyond graduation, I would potentially have to acquire funding or apply to have the game featured on distribution services such as Steam. Having a pre-existing fanbase would aid in such endeavours.

Albi Beshi, the composer for the game shared the soundtrack on his own social media sites, as well as on his **Soundcloud** and **Itunes** pages. Again, this provided an extra source of promotion to a pre-existing but separate fanbase.

Near the end of the project, when I had a more complete product to show, I shared videos on several prominent gaming websites such as **Reddit**, **Deviantart** and **Destructoid**. Although they wouldn't be front page news on such sites, they would potentially attract players from a previously untapped portion of the market.

I also negotiated promotion of the game via my employers - **Uproar Comics**, a Derry based Multimedia production company with an audience much greater than my own. They agreed to advertise the game on their website and social media feeds.

5.14 Reflective Blog

Part of the project required us to keep a reflective online blog charting our work as the project progressed. I used my pre-existing blog, michaelarbuthnot.wordpress.com to record my progress. Created in the first year of my degree, this blog already has a handful of followers and attracts various visitors who can read tutorials and view my other design work. I considered this to be an extra, albeit very limited form of advertising.

For individual links to blog articles posted, please refer to section 9.1 of the Appendix.

6. EVALUATION

What worked? What Didn't?

Looking back over this semester, this has been a tough but very rewarding project. Despite having a huge workload and a constant time pressure, there were very few features that I couldn't implement with at least basic functionality. I achieved most of what I set out to in my original plans for the game demo. I would consider the work so far to be a working proof of concept at this stage- it is playable, and is indicative of what a full product may look like, but still needs polish and refinement. Whilst I am satisfied with the quality of the games art direction – the silhouette style being as aesthetically powerful as I had hoped, if given more time I would go back and refine some of the coding- much of what I created came from a learner's perspective, rather than an experienced coder's, so I have no doubt that it could be improved – particularly taking into account more technical factors such as frame rates and processing efficiency, which for this project I chose deliberately not to focus on. Some of the coding for the movement and animation was a little bit buggy, and the enemy AI was very rudimentary – this however was a necessity of having limited time.

Additionally, I would add further refinement to the design of the levels themselves. Whilst I am pleased that they allow for the use of the full range of abilities the player receives, they currently exist for demonstrative purposes, rather than to actively challenge the player. I was however satisfied with how the use of props was successful in creating distinct environments which displayed their own identity despite only being shown in silhouette.

Learning Outcomes

My main learning outcome for this project was to gain experience programming. Although one semester of training wasn't nearly long enough to master the entire C# coding language, it was enough to give me a firm grasp of the fundamentals. I can now create simple scripts from memory, and can read and understand longer more complex scripts. I have no doubt that this has left me in a much better position for working on new projects in the future, whether my own, or as part of a team.

The second biggest contribution to my skill set is in 3D animation, purely by process of repetition I am much more experienced in not only crafting animations, but in putting them to technical use- migrating them between software packages, organizing them and coding them correctly. If animation is 90 percent art and 10 percent technical skill, this project has been an excellent way of obtaining that last 10 percent.

Time Management

In general I kept a fairly consistent pace with my work, starting early and making progress daily. It took longer than I thought to make the main player character, but I had very few technical setbacks during production, so everything progressed smoothly. Around the 6 week stage I entered a dip in

productivity- my motivation dropped significantly and I just couldn't get my head into work mode. I had however expected this to happen at some point during the semester, and since I had been working quite hard up to this point it didn't jeopardize my timeline too much. I found that during times of low productivity it was useful to focus on some of the fun, low priority features of the game – figuring it was better to be working on anything project related rather than ignoring it altogether, and using small victories such as creating some attractive 3d props or getting some social media buzz, as ways to boost morale. The last few weeks of development were spent assembling the game levels and making everything look as pretty as possible, whilst also ironing out any small kinks in the code.

7. CONCLUSION AND FUTURE WORK

Whilst the project was successful in terms of the scope and features I had originally planned, the game is a very short experience. There are numerous ways I could improve it to create a longer more commercially viable product.

Primarily, I would strive to create a wider variety of levels and environments, with a greater number of unique enemy types that the player could encounter. Creating the art assets for such is relatively straightforward, but creating challenging levels that take advantage of the gameplay mechanics would require extensive testing and refinement, and scripting the enemies would again require quite a bit of time. For this, I would consider outsourcing the coding to someone more experienced. The current enemies are functional but rudimentary, and creating challenging AI requires more skill than I currently possess.

As well as more levels and enemies, there are a few extra features that could ideally be implemented in a full release- a save and load system would be necessary if the whole game was to last longer than about an hour, and a map system to help players navigate through the larger game world. Additional movement abilities would also be nice to implement. Swimming and climbing ladders for example, would open up a range of possibilities for creative level design whilst giving players a wider range of movement options.

Finally I would continue with a more aggressive marketing campaign- send press releases and information to online game magazines. It would be wise to set up a dedicated website rather than relying on my own blog and social media profiles. At this point it would then be desirable to sell the full product rather than give it away for free so continuing to research marketing strategy and retail options would also be a valid objectives.

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[Accessed: 22nd Feb 2014]

9. APPENDICES

9.1 Personal Blog Posts Relating to This Project

Throughout the project we were required to keep a blog to record progress made on our project. These tutorials, notes and progress reports I created were made available on:

http://michaelarbuthnot.wordpress.com/

http://michaelarbuthnot.wordpress.com/2014/04/26/bound-monthly-university-presentations/

http://michaelarbuthnot.wordpress.com/2014/04/22/bound-first-in-game-screenshots/

http://michaelarbuthnot.wordpress.com/2014/04/08/bound-ost-preview/

http://michaelarbuthnot.wordpress.com/2014/04/08/bound-the-game-progress-update/

http://michaelarbuthnot.wordpress.com/2014/03/16/3ds-max-micro-tutorial-minor-unity-importing-problems/

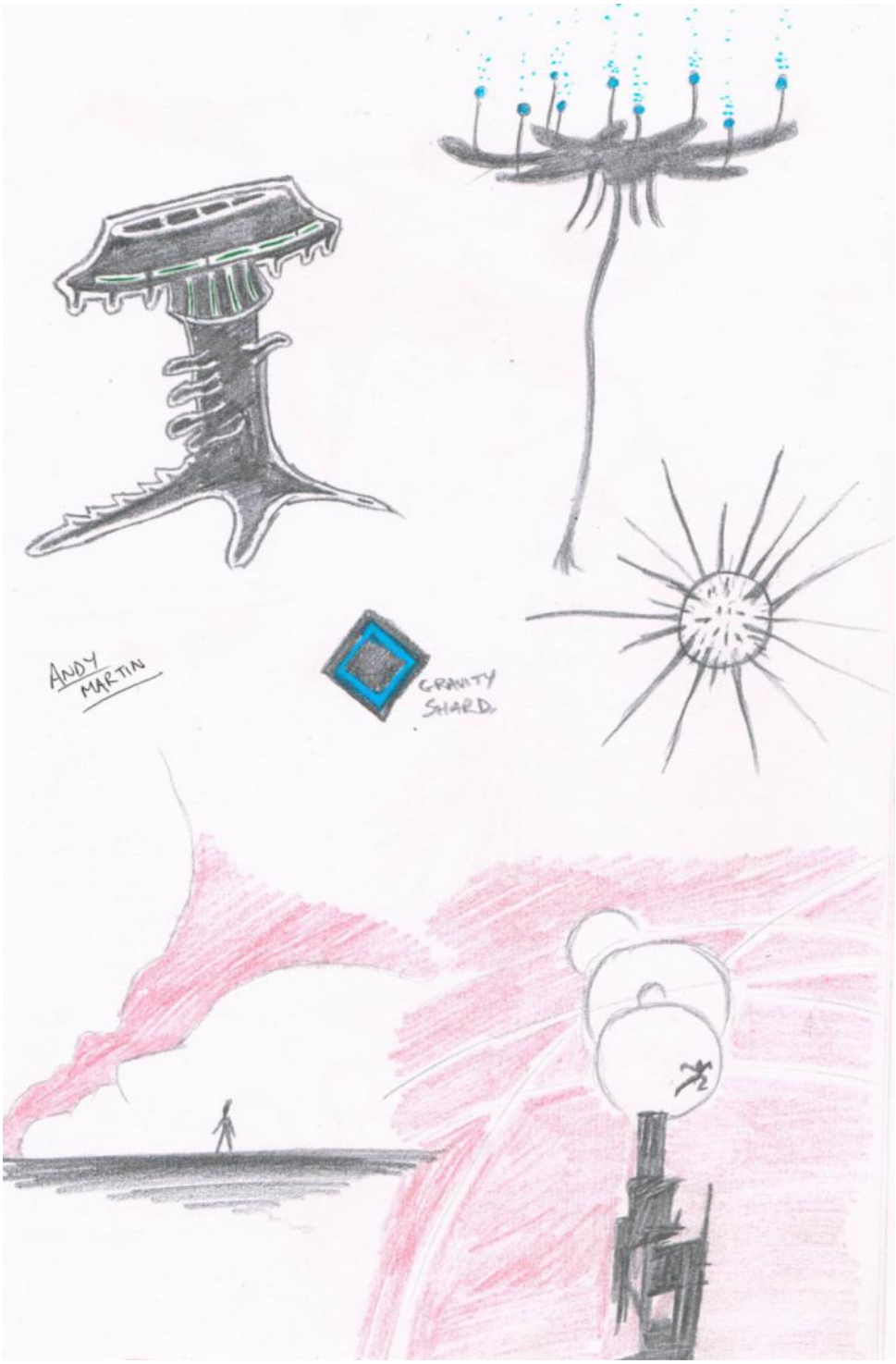
http://michaelarbuthnot.wordpress.com/2014/04/08/tutorial-unity-animation/

http://michaelarbuthnot.wordpress.com/2014/02/13/3d-tutorial-using-zbrush-and-zremesher-to-retopologise-a-high-poly-model/

http://michaelarbuthnot.wordpress.com/2014/02/09/3d-tutorial-using-topogun-to-retopologise-a-hi-poly-model/

9.2 Concept artwork

Below is a selection of scans of key artwork created at the concept and design phase. These are presented in approximately chronological order and as such are representative of the evolution my designs took throughout the project. These are available in their entirety in the Design sketchbook also submitted with this project. This artwork shows some of the sketches created in the character and level design process, discussed in more detail in the main text.

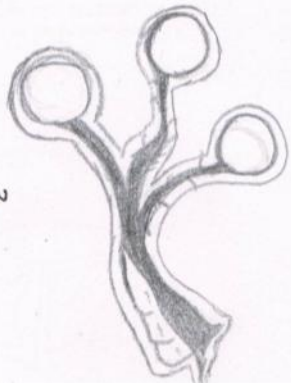


CHARACTER ANIMATIONS

- IDLE ✓
- RUN ✓
- JUMP ✓
- FALL ✓
- FARFALL
- CROUCH
- SLIDE
- WHIP – IDLE – RUN
- SHOOT – IDLE
  - RUN
  - CROUCH
  - JUMP
  - GLIDE
  - FALL
- GLIDE
- HIT RECOIL
- DIE
- DOUBLE JUMP
- SWIM?
- WATER WALK?
- CLIMB LADDER UP
- CLIMB LADDER DOWN
- WALL JUMP?

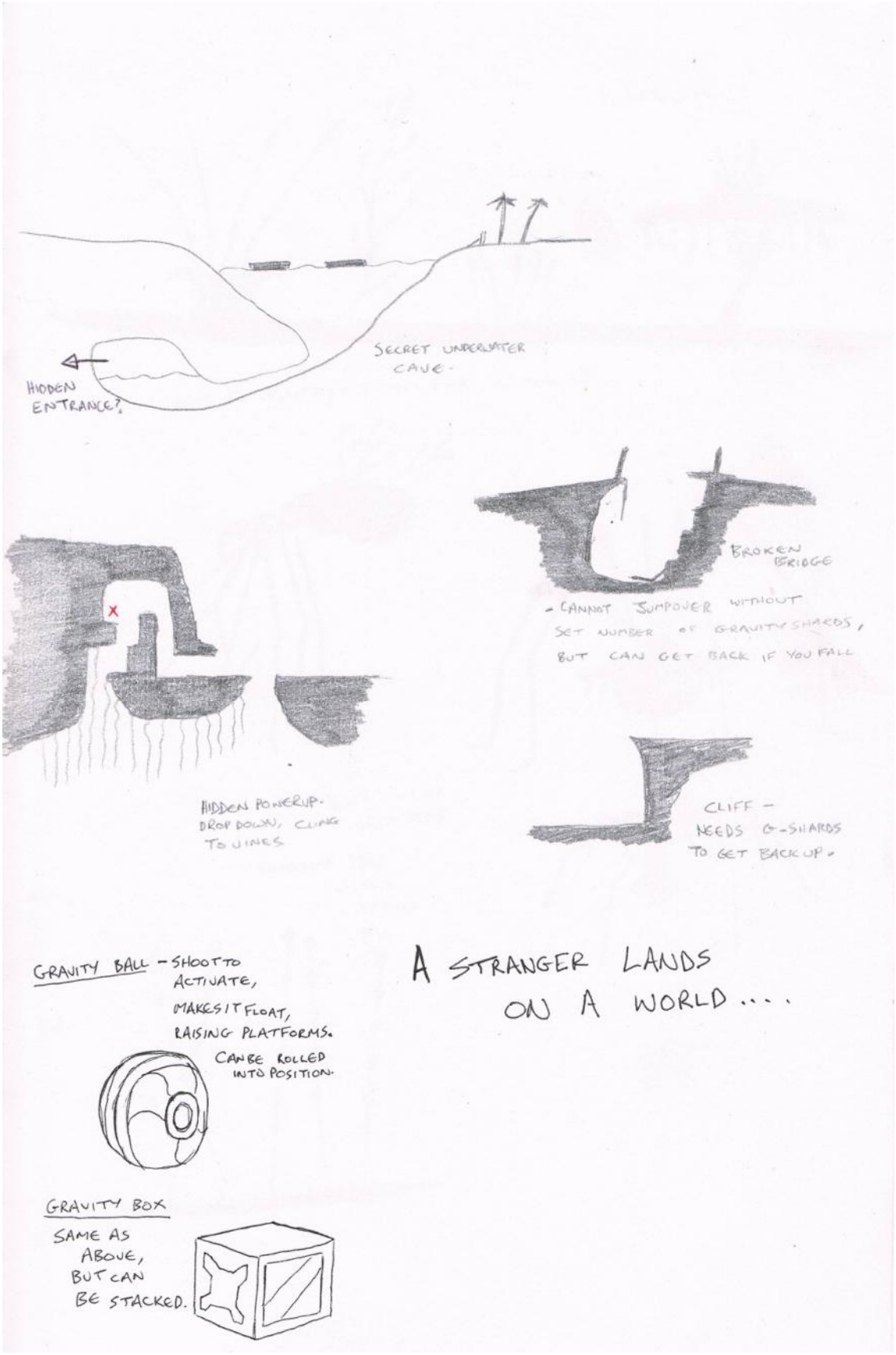
- BLOCK BUSTER BLOCKS

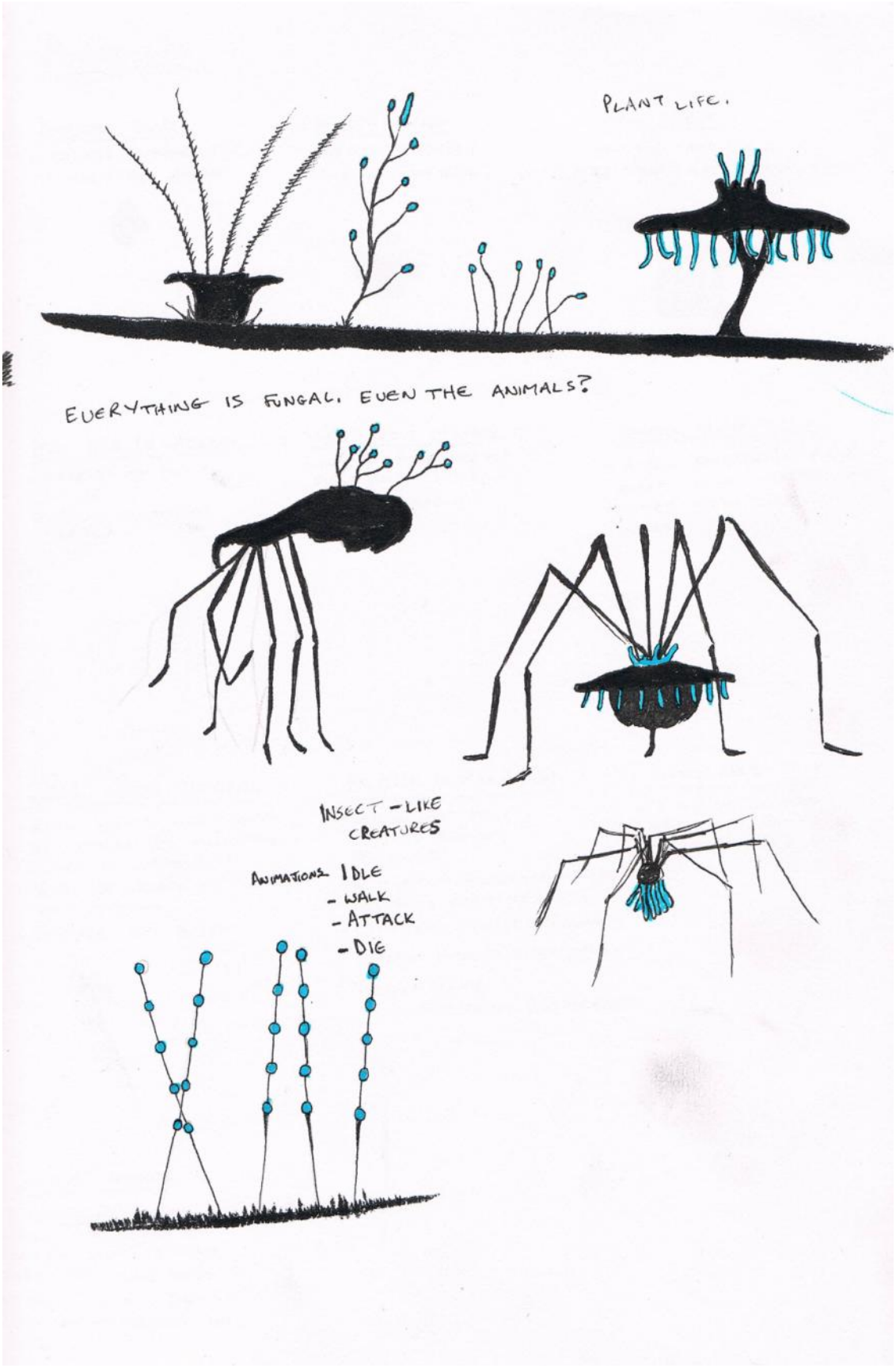
- BLUE VEINS INDICATE



POWER UPS

- GRAVITY SHARDS
- GLIDE BOOTS/BELT
- 'BLOCK BUSTER' GUN
- 'BEAM CABLE' MELEE WEAPON
- JUMP BOOTS/BELT
- WALL JUMP CLAWS? - TENDRILS
- HEALTH PICKUPS
- AMMO PICKUPS
- MAX HEALTH


SECRET UNDERWATER CAVE.
HIDDEN ENTRANCE?
BROKEN BRIDGE
- CANNOT JUMPOVER WITHOUT SET NUMBER OF GRAVITY SHARDS, BUT CAN GET BACK IF YOU FALL
HIDDEN POWERUP. DROP DOWN, CLING TO VINES
CLIFF - NEEDS G-SHARDS TO GET BACK UP.
GRAVITY BALL - SHOOT TO ACTIVATE, MAKES IT FLOAT, RAISING PLATFORMS.
CAN BE ROLLED INTO POSITION.
GRAVITY BOX
SAME AS ABOVE, BUT CAN BE STACKED.
A STRANGER LANDS ON A WORLD....

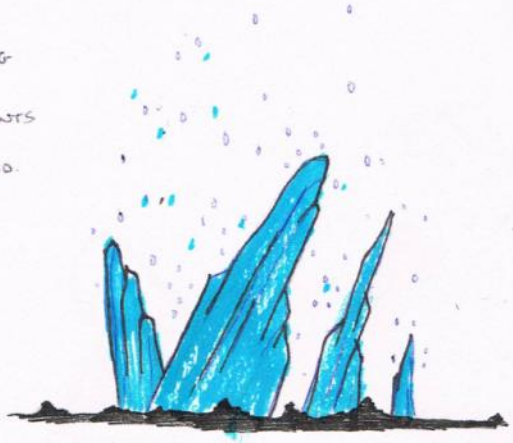

PLANT LIFE.
EVERYTHING IS FUNGAL. EVEN THE ANIMALS?
INSECT-LIKE CREATURES
ANIMATIONS IDLE
- WALK
- ATTACK
- DIE

POSSIBLE PLAY MECHANIC

- COLLECTING SHARDS INCREASES JUMP HEIGHT AND ADDS TO A FLEURON ENERGY BAR
- JUMPING, DOUBLE JUMPING AND GLIDING ALL COST FLEURON
- FLEURON RECHARGES OVERTIME, OR CAN BE INSTANTLY FILLED FROM WELLS.

10 GRAVITY SHARDS = 1 SEGMENT

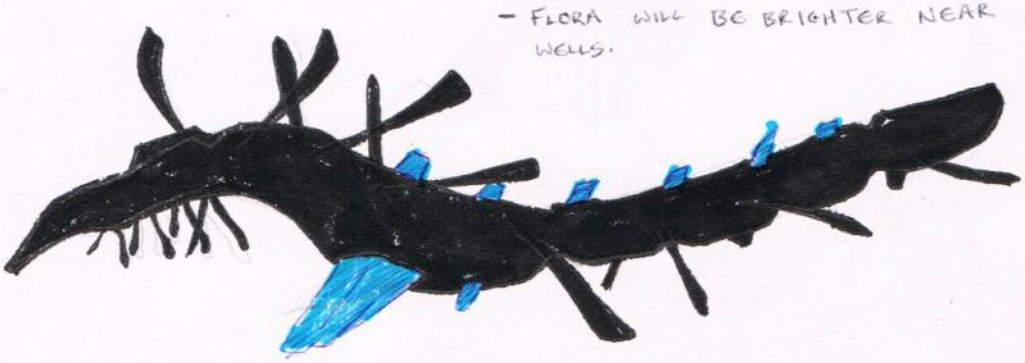
- JUMPING + DOUBLE JUMPING COST 3 SEGMENTS.
- GLIDING DRAINS BY 2 SEGMENTS A SECOND.
- RECOVERS 1 SEGMENT PER SECOND.



- NATURAL FLEURON WELL, LEAKS RESIDUAL FLEURON INTO THE ATMOSPHERE, INSTANTLY RECHARGING YOUR FLEURON BAR.

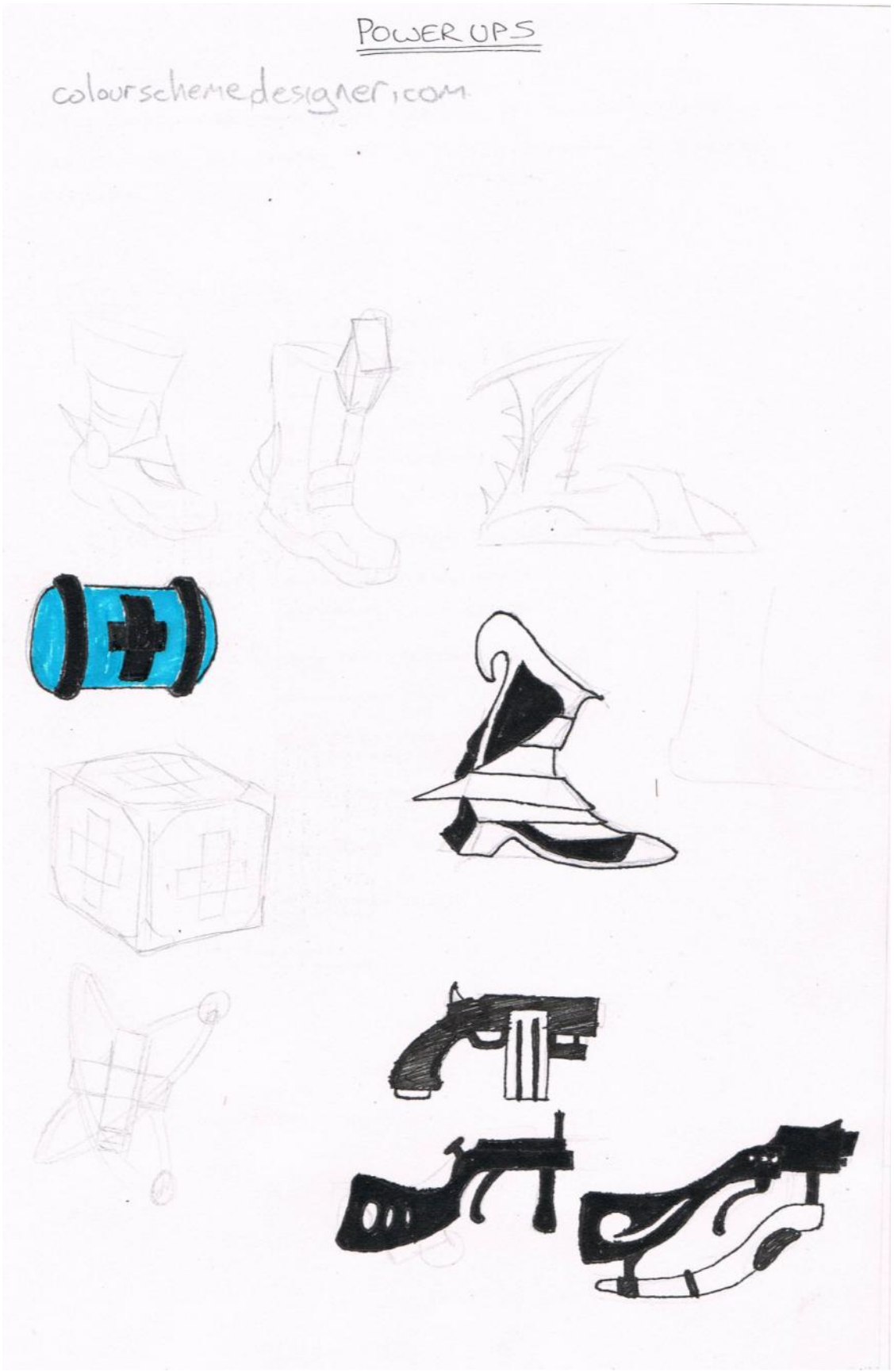
- LARGE NATIVE ANIMALS WILL LINGER NEAR FLEURON WELLS TO HELP KEEP THEM ALOFT
- FLORA WILL BE BRIGHTER NEAR WELLS.

FLEURON DRAGON



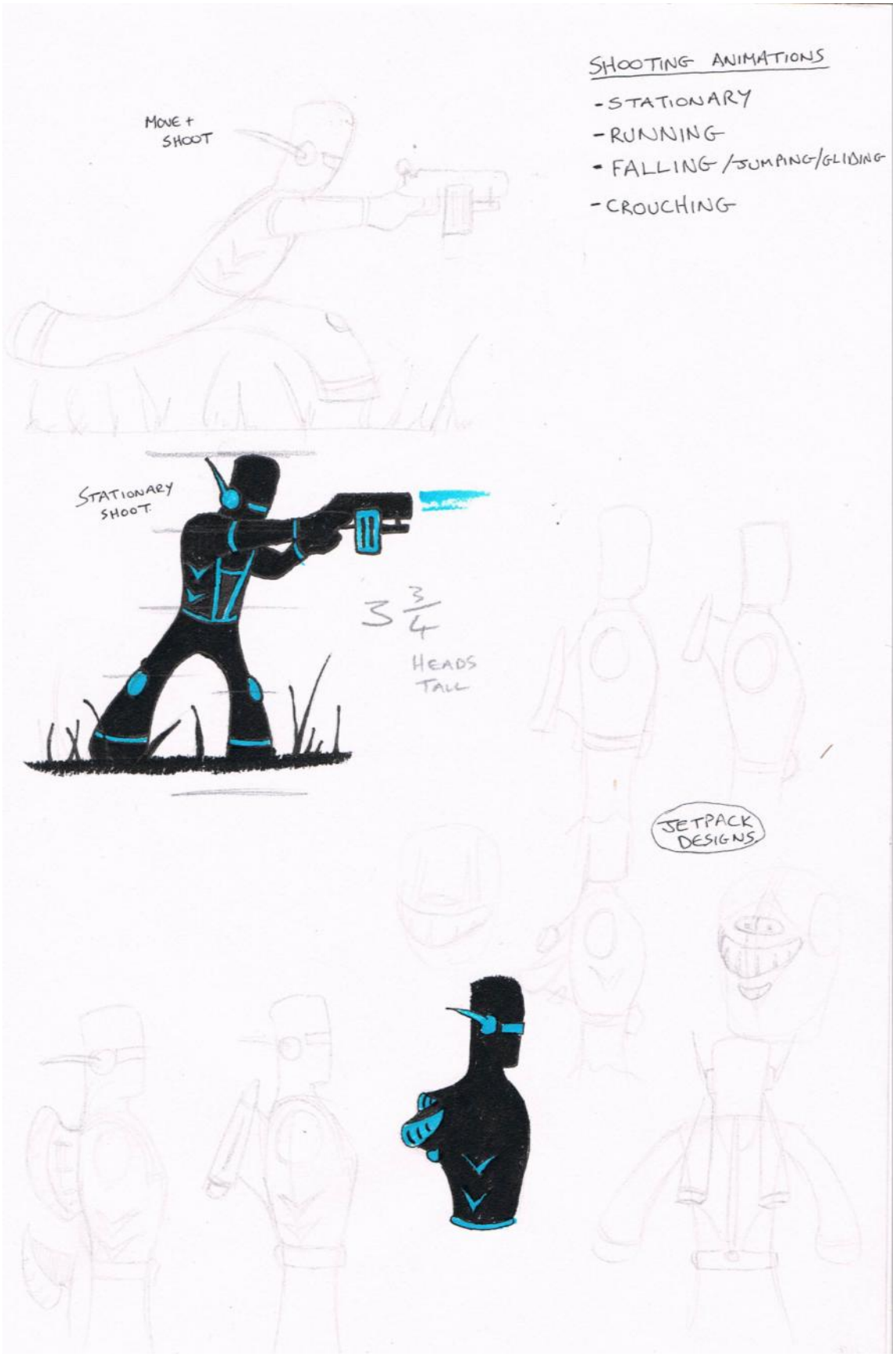
POWER UPS

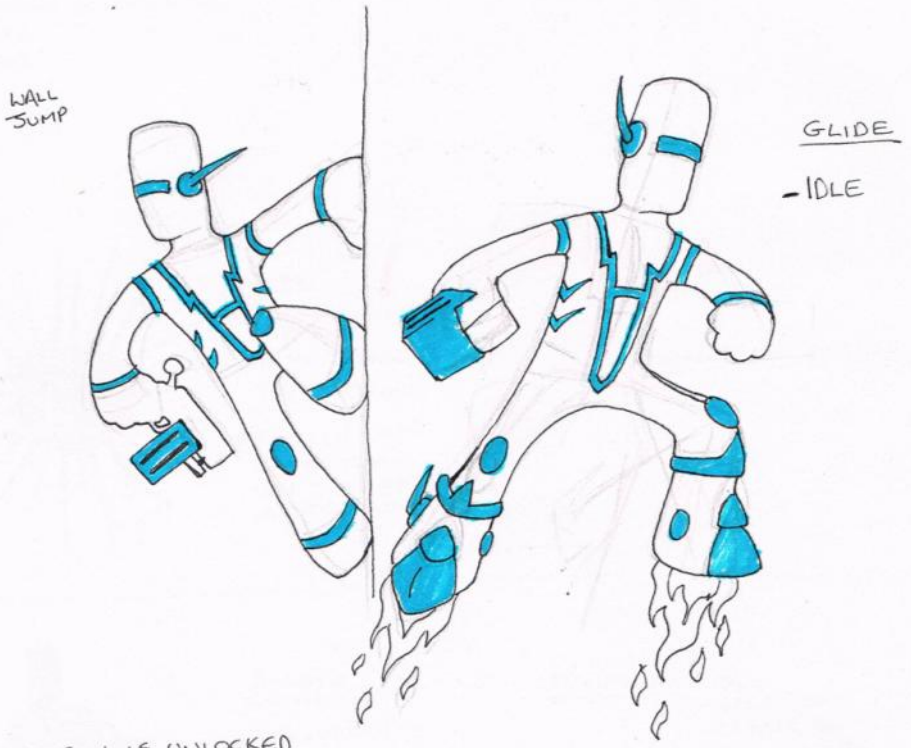
colourschemedesigner.com



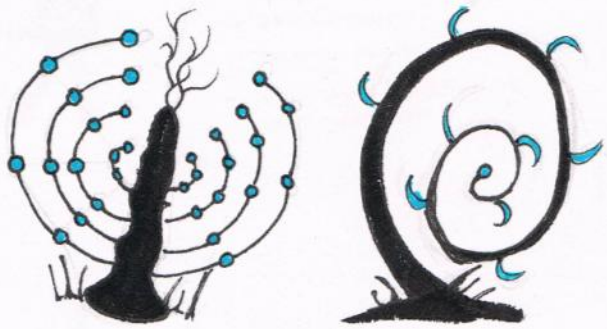
MAIN CHARACTER DESIGNS

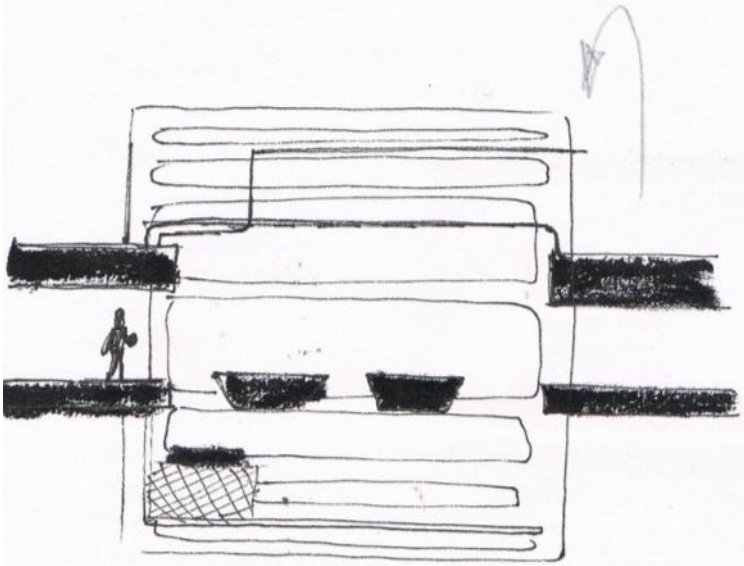

- GUN
- BELT
- BOOTS
- BEAMCABLE.
HANDS MIGHT WORK EASIER WITH GUN + CABLE.
BASIC
JET BOOTS


SHOOTING ANIMATIONS
- STATIONARY
- RUNNING
- FALLING / JUMPING / GLIDING
- CROUCHING
MOVE + SHOOT
STATIONARY SHOOT
3 3/4 HEADS TALL
JETPACK DESIGNS



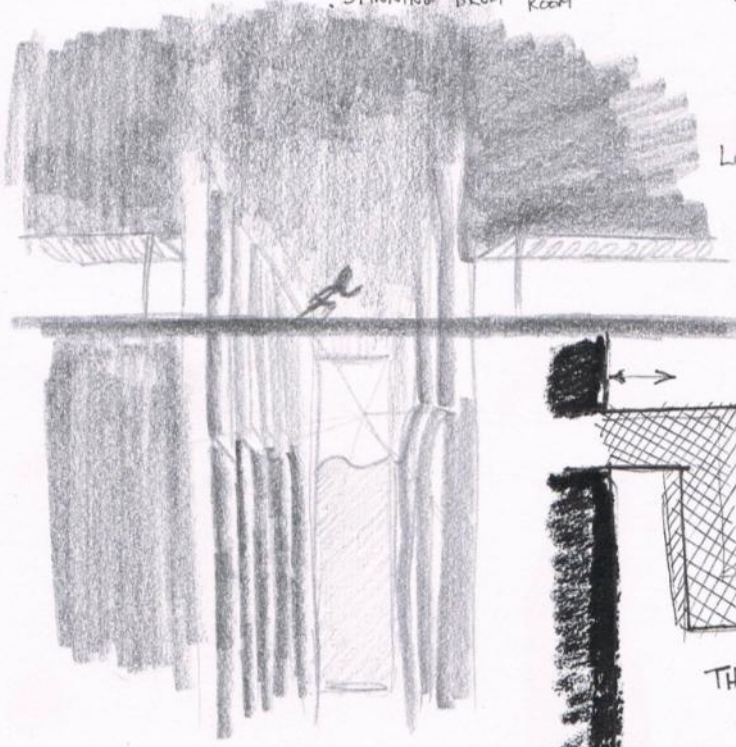
ONCE GUN IS UNLOCKED
IT IS ALWAYS VISIBLE IN
THE CHARACTERS RIGHT HAND



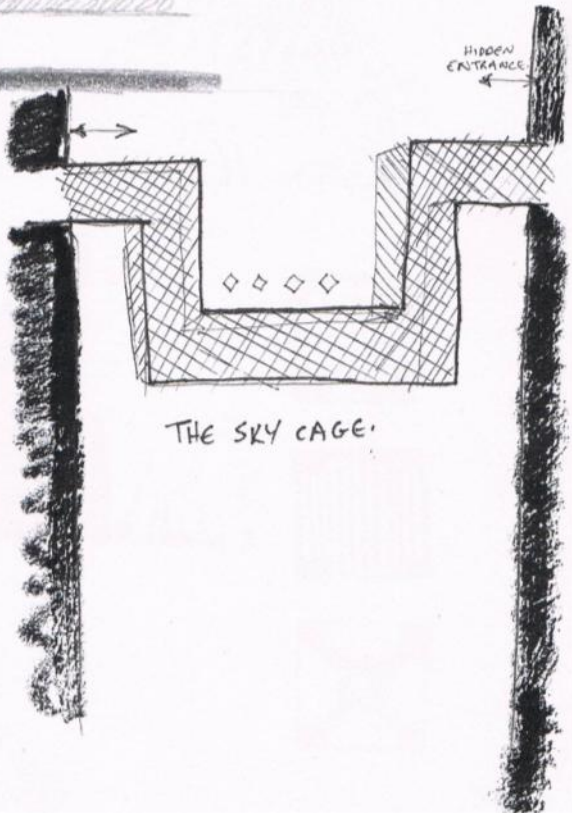


'SPINNING DRUM' ROOM

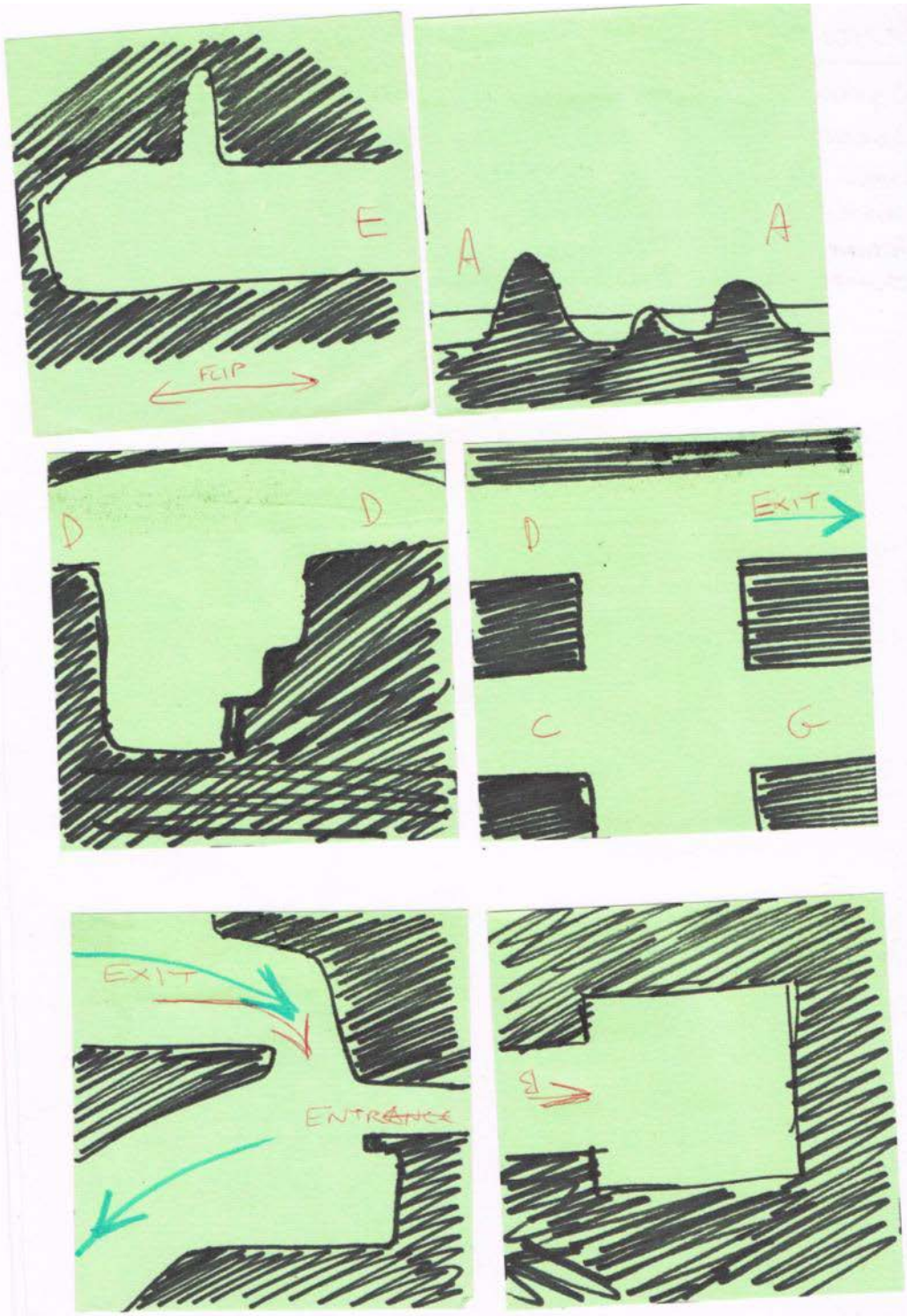
TATAMI SCREEN

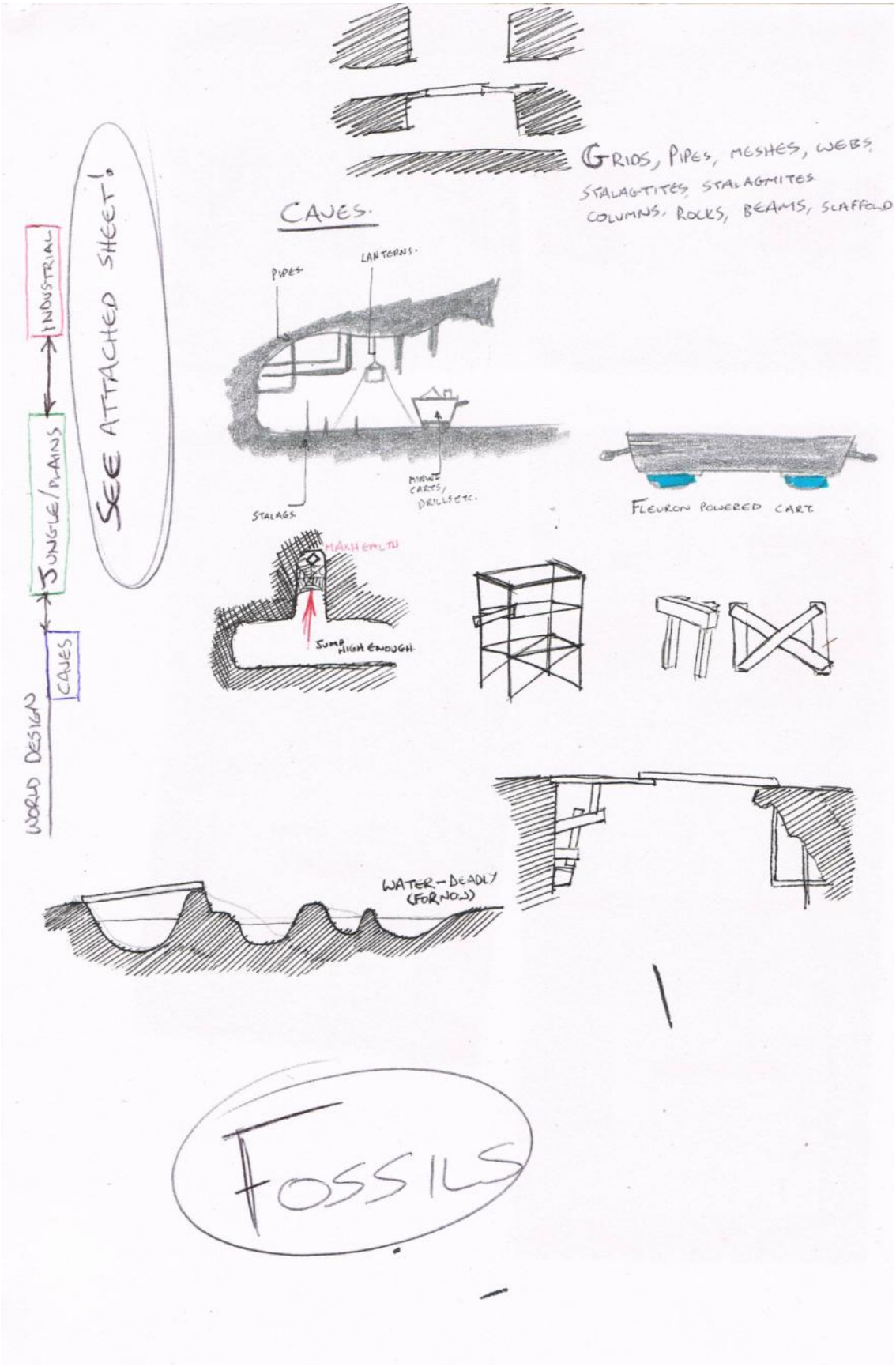


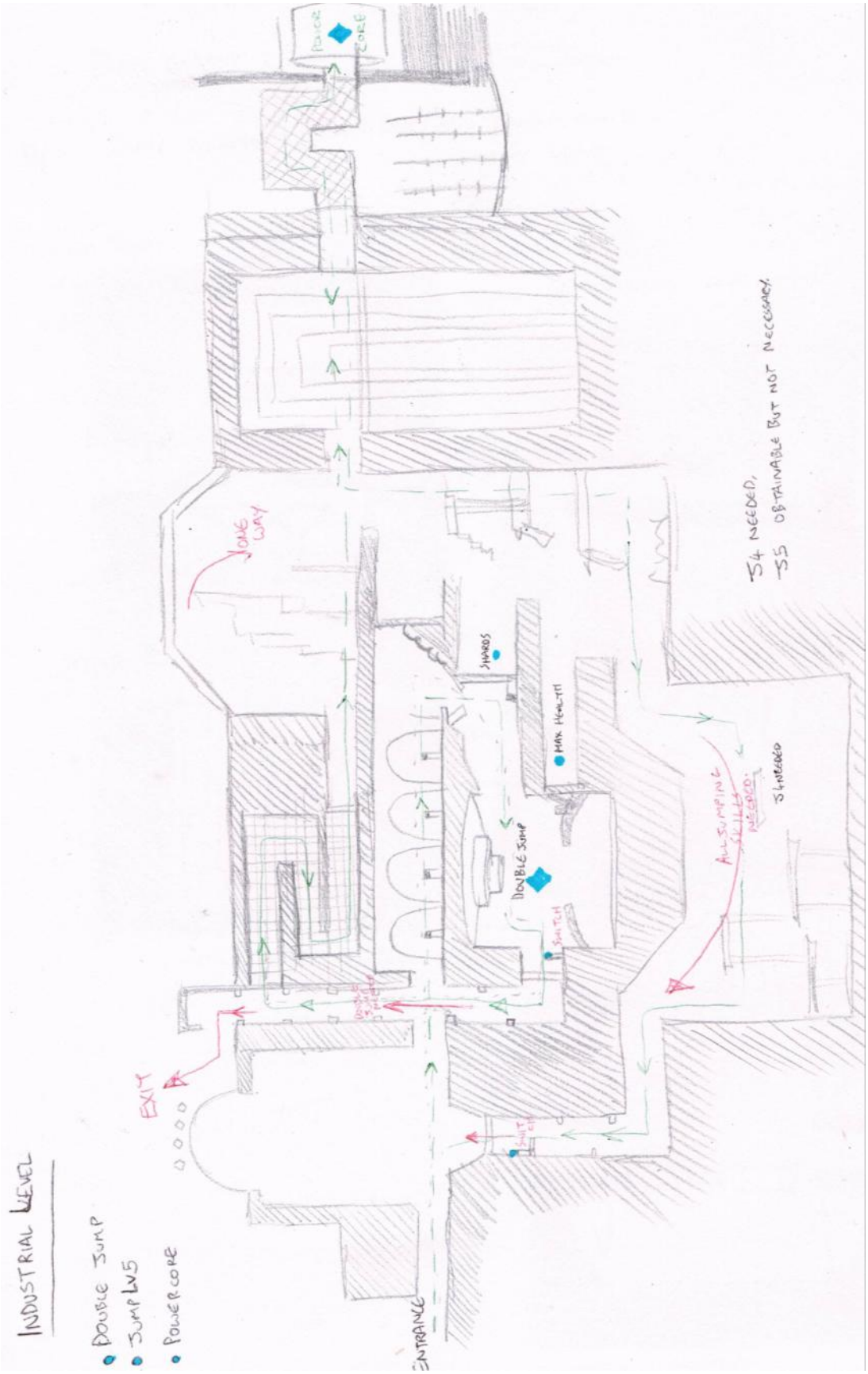
LONG PERSPECTIVE CHAMBER.



THE SKY CAGE.


E
FLIP
A
A
D
D
D
EXIT
C
G
EXIT
ENTRANCE
B


GRIDS, PIPES, MESHES, WEBS
STALAGTITES, STALAGMITES
COLUMNS, ROCKS, BEAMS, SCAFFOLD
CAVES.
LANTERNS.
PIPES
STALAGS.
MINING CARTS/ DRILLS ETC.
FLEURON POWERED CART.
MAXHEALTH
JUMP HIGH ENOUGH.
WATER - DEADLY (FOR NOW)
SEE ATTACHED SHEET!
INDUSTRIAL
JUNGLE/PLAINS
CAVES
WORLD DESIGN
FOSSILS


INDUSTRIAL LEVEL
DOUBLE JUMP
JUMP LV5
POWER CORE
EXIT
ENTRANCE
ONE WAY
SHARDS
HAK HEALTH
DOUBLE JUMP
SWITCH
POWER CORE
54 NEEDED,
55 OBTAINABLE BUT NOT NECESSARY.
54 NEEDED

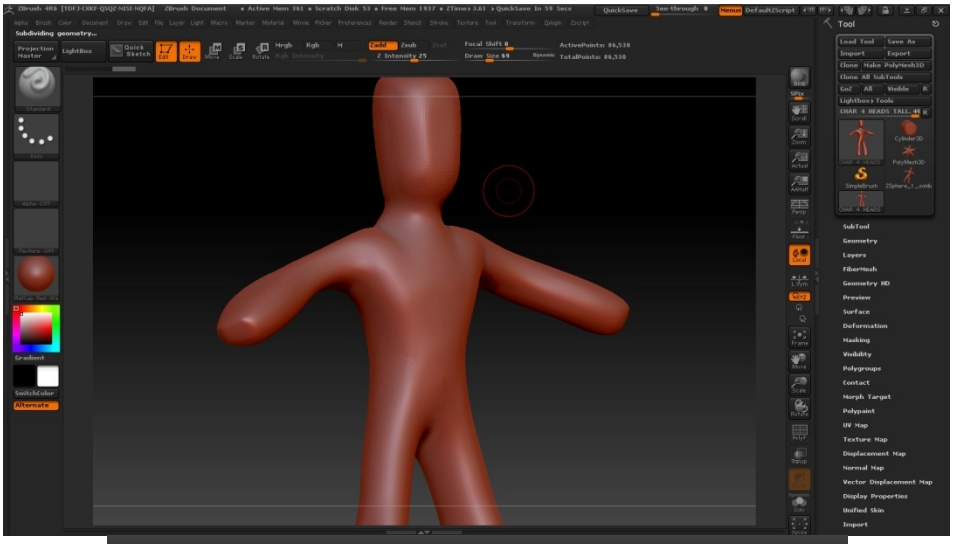
9.3 Asset Development

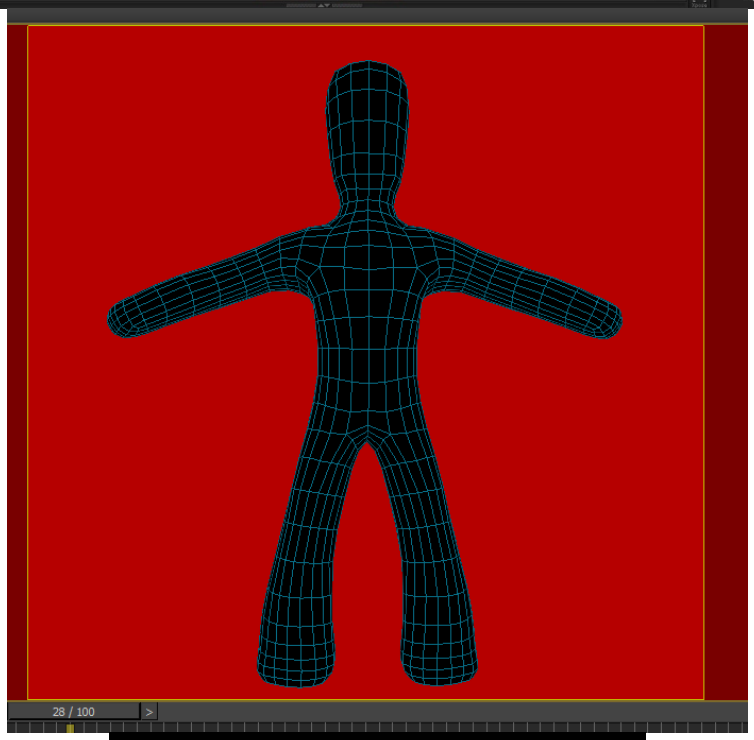
Colour selection

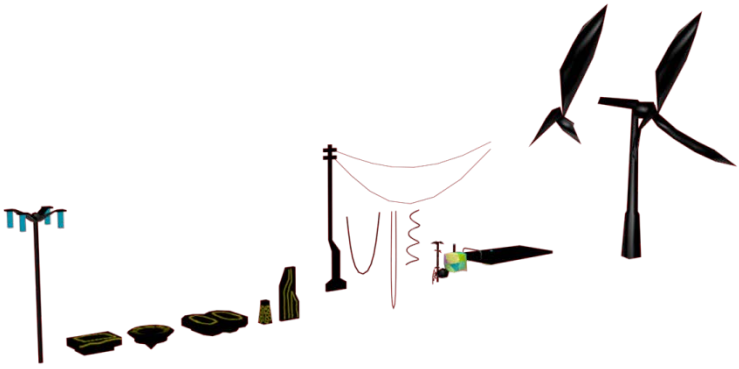
Seen here are tests of different sky colours. Since this was a large part of the visual aesthetic, getting the correct shade of red was important, as well as the correct shade of blue to go along with it. Early tests were the title writing was blue was too hard on the eye and was considered unpleasant with test audiences. The shade used in the third image was what I settled on, neither too dark nor too bright.

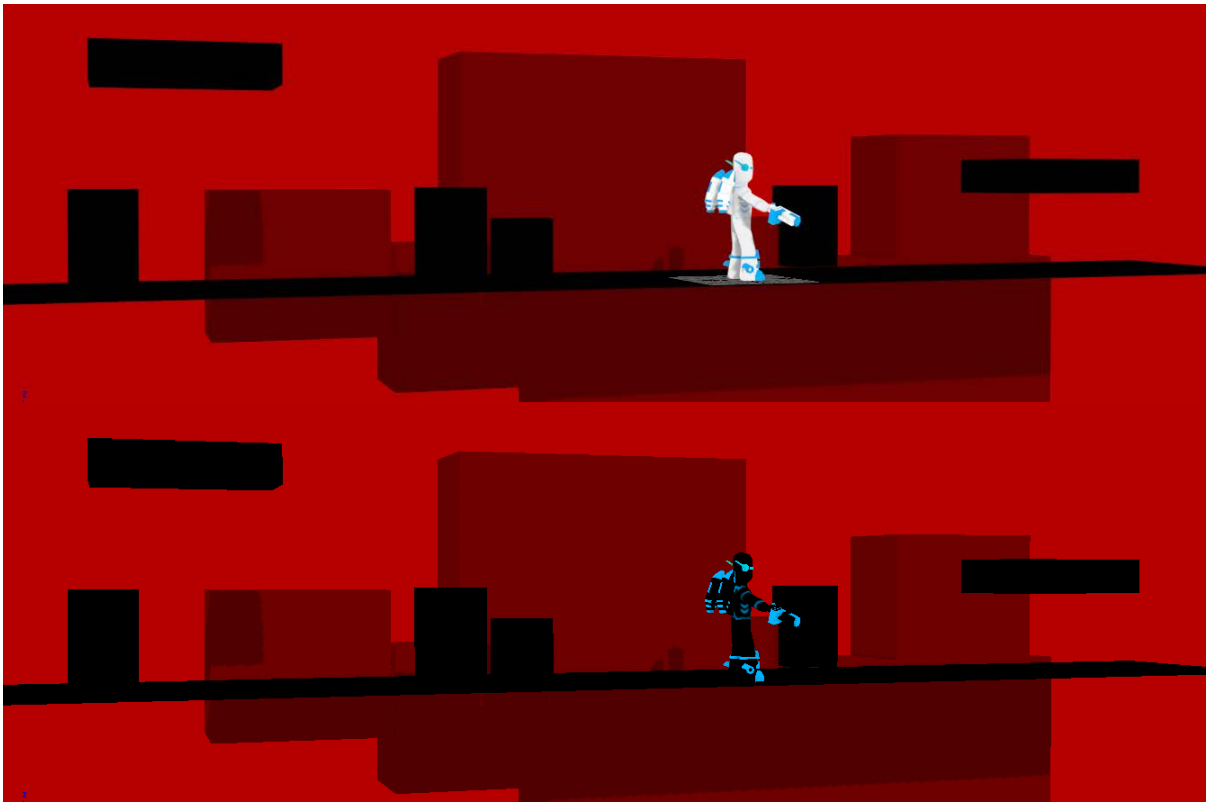
3d Modelling

Here are shots of the 3d modelling process of many of the assets.





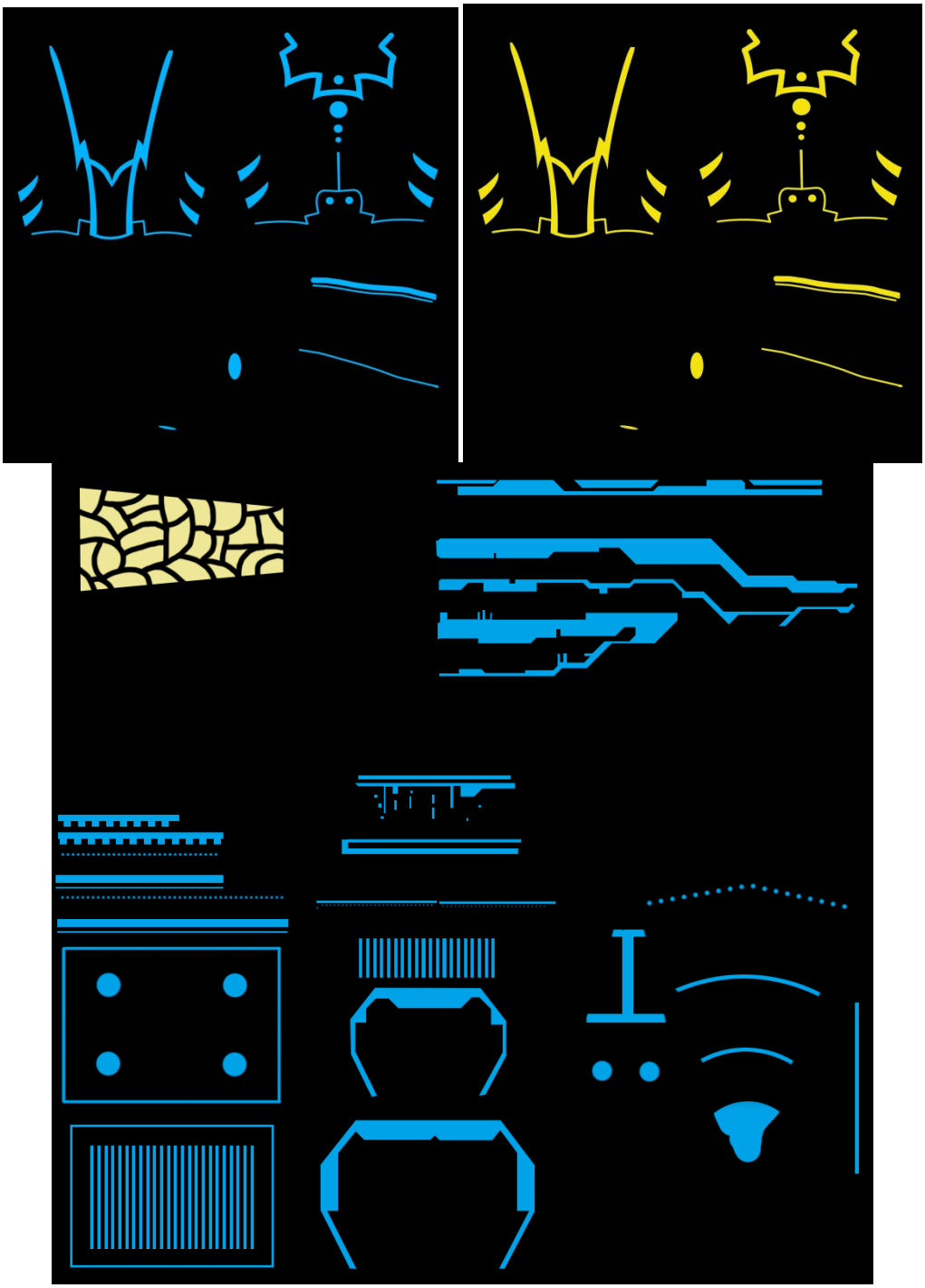




9.4 Texturing

Here are some of the textures created for the game. Since many the assets were all uniformly coloured, the texture files themselves could just be small and repeated across large objects. Shown below are the actual sized textures used for many of the objects used in the game.

Not every object was able to be filled by a single unwrapped texture. The main player, and some of the other assets needed to be unwrapped as shown below:



9.5 Dialogue Script

JOOT - J

COMPUTER - C

RADIO - X

UPON STARTING LEVEL 1

J OWW.... THAT HURT! WHERE THE HECK AM I?! LOOKS LIKE THE SHIPS ENGINE IS KAPUT! COMPUTER- CAN YOU RELAY THROUGH MY WRIST COMPUTER?

C I AM AT YOUR SERVICE MASTER LIGHTRAY.

J CONTROL – MY DANG ENGINE JUST BLEW! I'VE CRASH LANDED ON THE PLANET'S SURFACE. I NEED A RESCUE SQUAD!

C SORRY PILOT. THE EMPLOYMENT CONTRACT YOU SIGNED WITH ZARIK CORP CLEARLY STATES IN TEENSY WRITING THAT YOU AREN'T COVERED BY OUR RESCUE INSURANCE POLICY. YOU'RE ON YOUR OWN.

J WELL THAT'S JUST BLOODY TYPICAL. COMPUTER. CAN YOUR SCANNERS DETECT ANY SETTLEMENTS NEARBY?

C I DETECT VARIOUS INDIGENOUS CREATURES AND FOLIAGE, THOUGH FURTHER DETAILS ARE IMPOSSIBLE WITHOUT CLOSER INSPECTION. STRONG RESIDUAL TRACES OF AN UNKNOWN ENERGY SOURCE ARE ABUNDANT, MAKING MY READINGS A TEENSY BIT UNRELIABLE.

J HMM... THAT'S NO GOOD. GUESS I SHOULD HAVE A LOOK AROUND THE OLD FASHIONED WAY THEN.

C YOU ALWAYS WERE AN ADVENTUROUS ONE SIR. I DETECT A PARTICULARLY STRONG ENERGY SOURCE CLOSE BY TO THE EAST. PERHAPS YOU SHOULD START THERE?

J THANKS COMPUTER.

PICK UP FIRST GRAVITY SHARD

J WOOW! WHAT THE FLICK WAS THAT? THAT WEIRD DIAMOND THING JUST ATTACHED ITSELF TO MY SUIT!

C OH MY! THIS MUST BE A PIECE OF NATIVE TECHNOLOGY. IT SEEMS TO HAVE STORED AND AMPLIFIED THE AMBIENT ENERGY MY SENSORS ARE PICKING UP ALL OVER THE PLANET.

J I FEEL KINDA... AWESOME... LIGHTER SOMEHOW!

C I SAY! UPON CLOSER INSPECTION, THIS APPEARS TO BE GRAVITITE!

J GRAVITITE?

C GRAVITITE! A UNIQUE ELEMENT THAT HAS ONLY EVER EXISTED THEORETICALLY, NEVER ACTUALLY ENCOUNTERED IN THIS DIMENSION. PHYSICISTS SPECULATE IT HAS POWERFUL CONTROL OVER GRAVITY. WELL DONE MASTER LIGHTRAY- THIS COULD BE THE DISCOVERY OF THE DECADE, AND IS SURE TO MAKE YOU VERY RICH!

J HUHH... HOW ABOUT THAT! WELL LET'S JUST SEE ABOUT FINDING A WAY TO REPAIR THE SHIP FIRST. THEN WE CAN BREAK OUT THE CHAMPAGNE!

C I'M AFRAID I'M NOT MUCH OF A DRINKER...

PICK UP GRAVITY WHIP

J OOH WHATS THIS SHINY THING?!

C I HAVE NO IDEA, ALTHOUGH IT DOES RESEMBLE A WHIP. PERHAPS IT WAS A WEAPON BELONGING TO THE NATIVES. ANTHROPOLOGISTS WOULD LOVE TO GET THEIR HANDS ON THIS- LOOKS LIKE YOU'RE RICH YET AGAIN MASTER LIGHTRAY.

J NICE. I CAN USE THESE TO KEEP THOSE WEIRD CREATURES AT BAY- THOSE BLIGGERS CAN STING!

C OF COURSE I COULD BE WRONG AND THIS IS SOME KIND OF PRICELESS, FRAGILE AND IRREPLACEABLE ARTEFACT OF HISTORICAL AND CULTURAL SIGNIFICANCE...

C PRESS 'A' TO GIVE IT A SWING!

PICK UP GRAVITITE ACCELERATOR

J MORE TOYS! NICE. THIS LOOKS LIKE SOME KINDA GUN! SHOULD HELP WITH THE SELF PRESERVATION!

C HMM... INITIAL SCANS INDICATE THAT THE SHOTS FROM THIS DEVICE SERVE TO EXCITE GRAVITITE MOLECULES TO THE POINT OF COMBUSTION. FROM MY ADMITTEDLY LIMITED OBSERVATIONS, THE CULTURE OF THIS WORLD SEEMED TO BE FAIRLY PEACEFUL. I WOULD WAGER THAT THIS 'GUN' HAS A FUNCTIONAL RATHER THAN A COMBAT – ORIENTATED APPLICATION.

J REALLY? LIKE WHAT?

C I DON'T KNOW JOOT. YOU'LL JUST HAVE TO EXPERIMENT. TRY SHOOTING IT AT GLOWY BLUE THINGS!

J COOOOL...

PICK UP GLIDE BOOTS.

J SHOES?

C THESE STYLISH FASHION ACCESSORIES EXERT A CONSTANT STREAM OF LOW INTENSITY GRAVITITE IONS FROM THE SOLES OF YOUR FEET. I'D WAGER THIS WILL ALLOW YOU TO SLOW YOUR DESCENT WHEN FALLING AND ALLOW YOU TO GLIDE ACROSS WIDER GAPS THAN SIMPLY JUMPING WILL ALLOW!

J NIFTY! AND BLUE IS DEFINITELY MY COLOUR.

C INDEED! VERY DAPPER, SIR. YOU'LL LOOK VERY HANDSOME WHILST GIVING THOSE SAVAGE BEASTS A GOOD ROLLICKING.

EXITING CAVES WHEN SOLDIERS ARRIVE

C OH MY! MASTER JOOT, I'M DETECTING SIGNALS FROM A ZARIK CORPORATION MINING SHIP

J AWESOME! THEY MUST HAVE COME TO RESCUE ME AFTER ALL! PATCH ME THROUGH

C YES SIR.

J CONTROL? THIS IS JOOT LIGHTRAY! BOY AM I GLAD TO SEE YOU!

X WHO IS THIS? HOW DID YOU GET THIS FREQUENCY?

J UH THIS IS JOOT LIGHTRAY! IM THE SCOUT WHO CRASH LANDED HERE- YOU'RE HERE TO RESCUE ME RIGHT?!

X NEGATIVE. WE'VE BEEN TRACING YOUR SUIT'S SCANNERS SINCE YOU CRASHED AND DECIDED THAT THE GRAVITITE MINERAL YOU DISCOVERED IS TOO VALUABLE TO IGNORE. WERE HERE TO STRIP THE PLANET OF ITS RESOURCES

J WHAT? BUT THAT WILL CAUSE INCREDIBLE DAMAGE TO THE ENVIRONMENT!

X THE CORPORATION DOESNT CARE ABOUT THAT, SCOUT. OUR SECURITY FORCES HAVE BEEN ORDERED TO SHOOT ANYTHING THAT MOVES. THAT INCLUDES YOU. STAY OUT OF OUR WAY.

J WELL I NEVER! COMPUTER. ANY IDEAS WHAT TO DO NEXT?

C I SUGGEST WE CONTINUE LOOKING FOR A WAY TO REPAIR THE SHIP SIR. I DETECT SEVERAL ENERGY SOURCES TO THE EAST BEYOND WHERE WE CRASHED. PERHAPS WE INVESTIGATE THERE?

J ALRIGHT. THANKS COMPUTER.

PICK UP JETPACK

J HOLY CRAP! A JETPACK?! THIS IS WHAT I'M TALKING ABOUT!

C WHAT A DELIGHTFUL CONTRAPTION. THIS APPARATUS SEEMS ENGINEERED TO EXPEL A CONCENTRATED BURST OF GRAVITITE PARTICLES IN A DOWNWARD VECTOR, PROVIDING YOU WITH A SUDDEN BURST OF MOMENTUM IN THE OPPOSITE DIRECTION!

J WHUT?

C A DOUBLE JUMP SIR.

J OH... SO NOT A JETPACK... THATS SLIGHTLY DISAPPOINTING. BUT STILL – DOUBLE JUMP. THAT'S A COOL PARTY TRICK. WITH ALL THIS GEAR THERE SHOULD BE PRETTY MUCH NOWHERE I CAN'T GO NOW!

C INDEED! MY SENSORS INDICATE JUST ONE MORE SIGNIFICANT ENERGY SOURCE IN THIS REGION, AND IT SEEMS TO BE NEARBY! LET'S GO INVESTIGATE.

PICK UP POWER CORE

J COMPUTER! WHATS THIS DEVICE? IS THIS THE POWER SOURCE YOU WERE DETECTING?

C WHY YES, MASTER JOOT. AND WHAT LUCK! ON CLOSER INSPECTION THIS APPEARS TO BE A GRAVITITE BASED ENERGY CELL OF SORTS. I'LL WAGER MY CIRCUITS THAT THIS COULD BE ADAPTED TO FIX YOUR SHIPS ENGINE AND LET US LEAVE THIS PLANET!

J AWESOME! GREAT WORK COMPUTER. AND IT'S A GOOD JOB I'M A PRODIGIOUSLY TALENTED MECHANIC. I SHOULD BE ABLE TO FIT THIS THING IN NO TIME!

C QUITE THE LUCKY CONVENIENCE SIR!

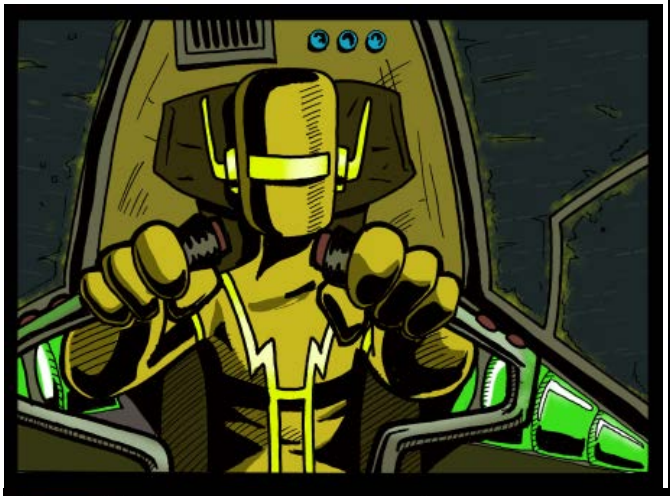
J LET'S HEAD BACK TO THE SHIP PRONTO!

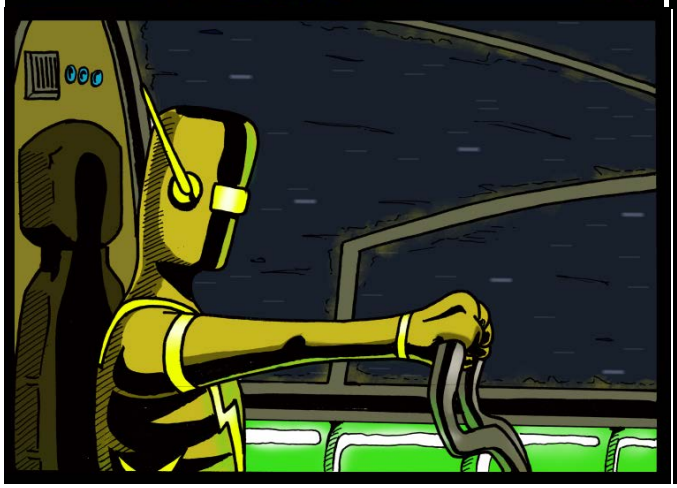
BACK AT SHIP

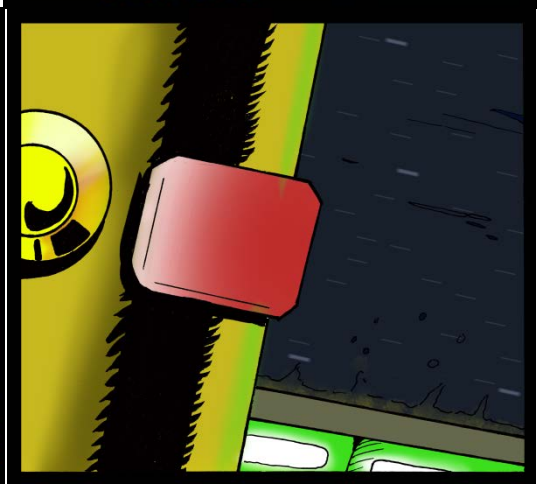
J ALRIGHT! WELL THAT WAS QUITE THE ADVENTURE BUT I THINK I'VE HAD ENOUGH! LETS GET THIS THING INSTALLED AND GET OFF THIS PLANET! I HAVE A BONE TO PICK WITH THE ZARIK CORPORATION!

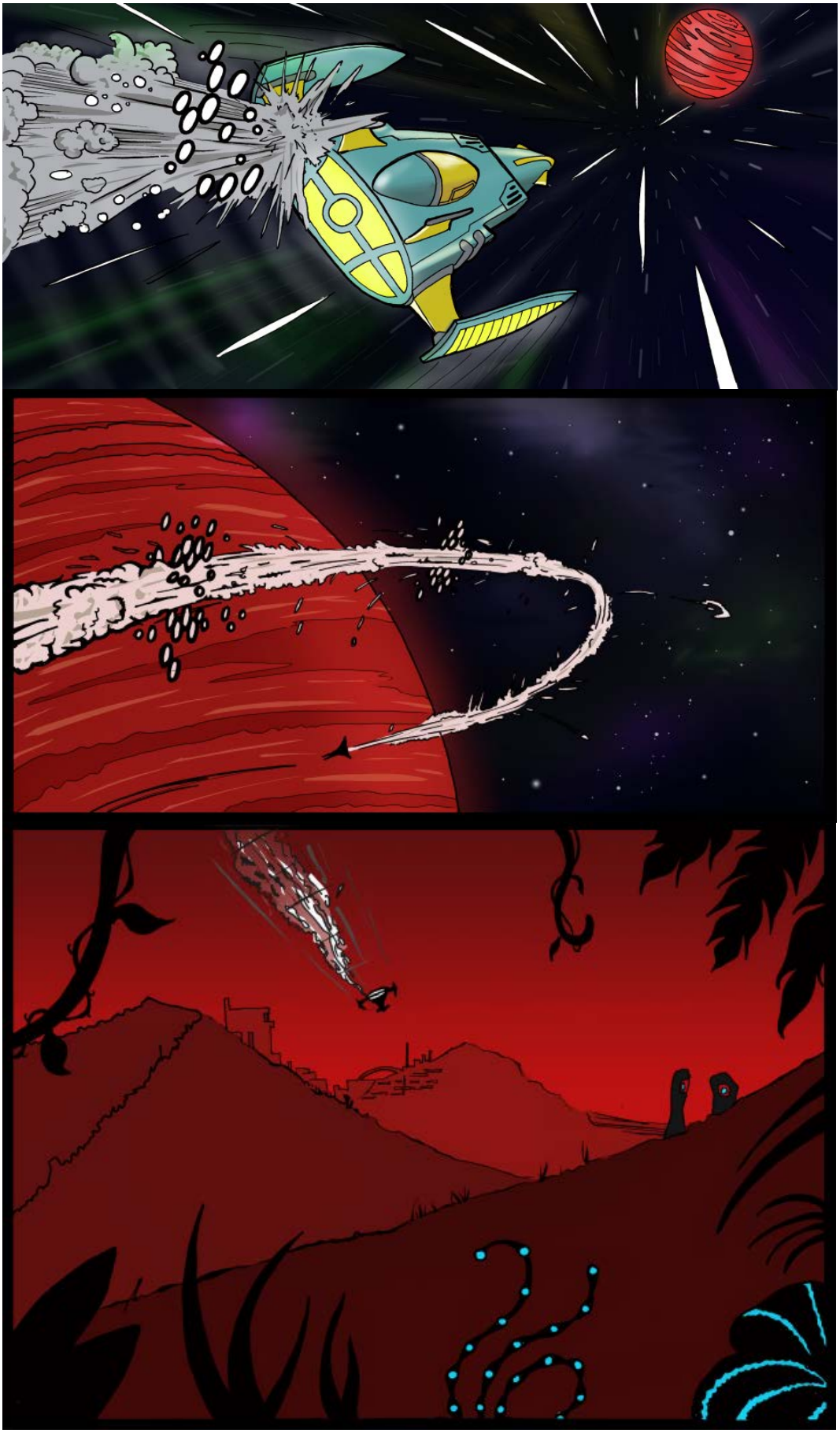
9.6 Comic panels

For the short intro sequence, I used comic panels to quickly set up the story. These are shown below. They were drawn by hand, scanned and coloured in Photoshop. The text captions were created as separate assets so are not shown in these images.

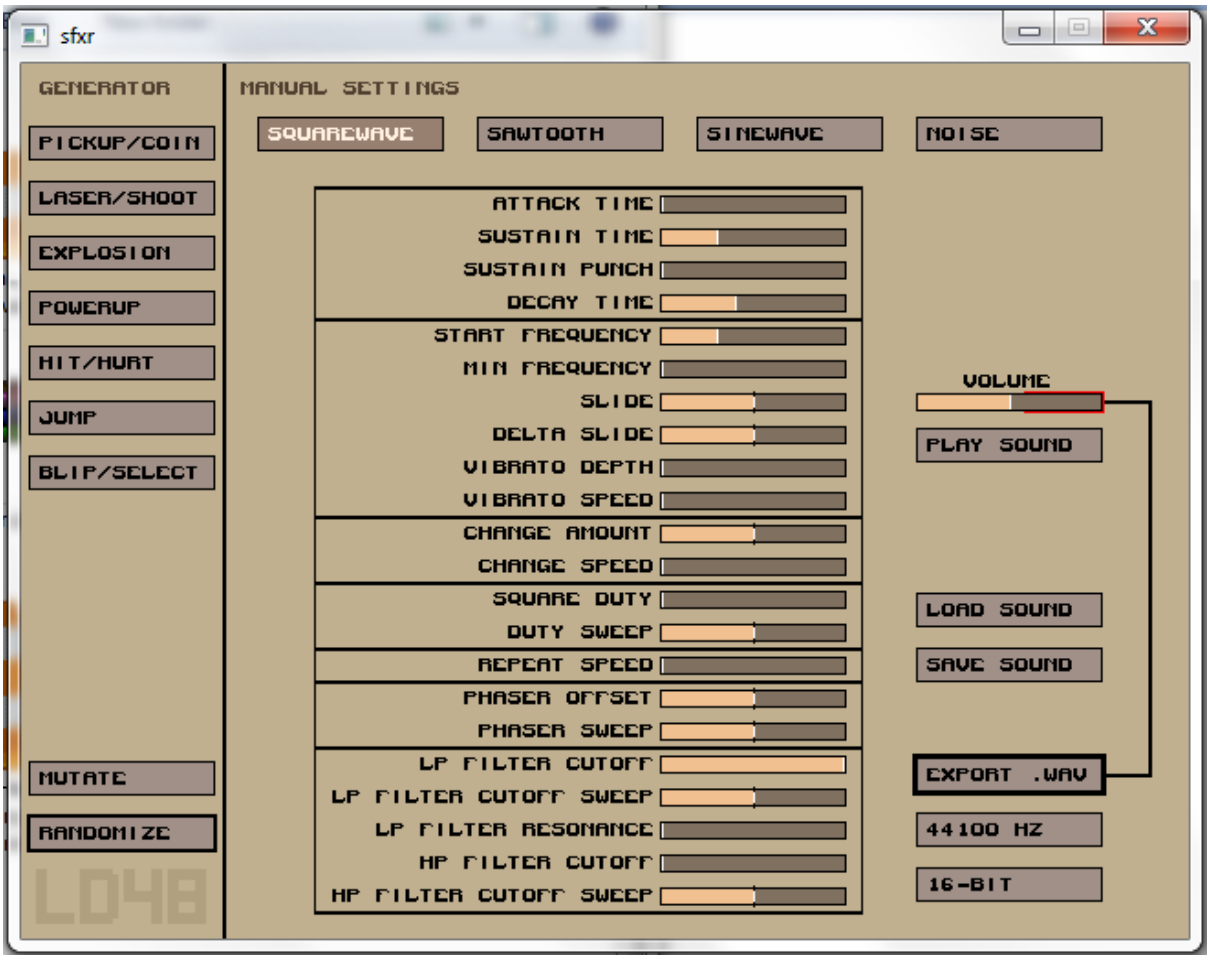








9.7 SFXR Sound Generator



9.8 Sample Scripts/code

Here are samples of some of the code I wrote for the game. These are some of the shorter, simpler scripts created for basic functions. The code for the character controller was much longer. I created several dozen scripts in total for the whole game.

Max Ammo Powerup.

This simple script is used to increase the players max ammo capacity. It sets the powerup to rotate, automatically, increase the players max ammo capacity when touched, set current capacity equal to the new maximum, then destroy the object upon completion.

```
using UnityEngine;
using System.Collections;
public class script_pickup_max_ammo : MonoBehaviour {

	public Vector2 rotationVelocity;
	public AudioClip sfx;
	// Use this for initialization
	void Update ()
	{
		transform.Rotate (rotationVelocity * Time.deltaTime);
	}

	void OnTriggerEnter(Collider other)
	{
		if (other.gameObject.tag == "Player")
		{
			AudioSource.PlayClipAtPoint (sfx, transform.position);
			script_player_stats.max_ammo += 5;
			script_player_stats.ammo = script_player_stats.max_ammo;
			Destroy(gameObject);
		}
	}
}
```

Title Menu Navigation

This script controls the navigation of the title menu- it controls the movement of the selector based on button presses, then loads the correct scene depending on which entry was selected.

```
using UnityEngine;
using System.Collections;

public class script_title_menu : MonoBehaviour {

	bool newgame = true;
	public AudioClip sfx_choice;
	public AudioClip sfx_confirm;



	// Update is called once per frame
	void Update () {

		if (Input.GetKeyDown ( "up" ))
			{
			newgame = true;
			AudioSource.PlayClipAtPoint (sfx_choice, transform.position);
			Vector3 pos = new Vector3(400f,100f,100f);
			transform.position = pos;
			}


		if (Input.GetKeyDown ( "down" ))
			{
			newgame = false;
			AudioSource.PlayClipAtPoint (sfx_choice, transform.position);
			Vector3 pos = new Vector3(400f,99.16f,100f);
			transform.position = pos;
			}

		if (newgame == true && Input.GetKeyDown ( "return" ))
			{
			AudioSource.PlayClipAtPoint (sfx_confirm, transform.position);
			Application.LoadLevel ("scene_cutscene");
			}

		if (newgame == false && Input.GetKeyDown ( "return" ))
			{
			Application.Quit();
			}
	}
}
```

9.9 Games Used as Inspiration

Here are screenshots of the games listed in the main body of the text. Full details can be found in the references section of this document. These games were each influential on the development of Bound- some more so than others, some for their art style, and some for their gameplay.

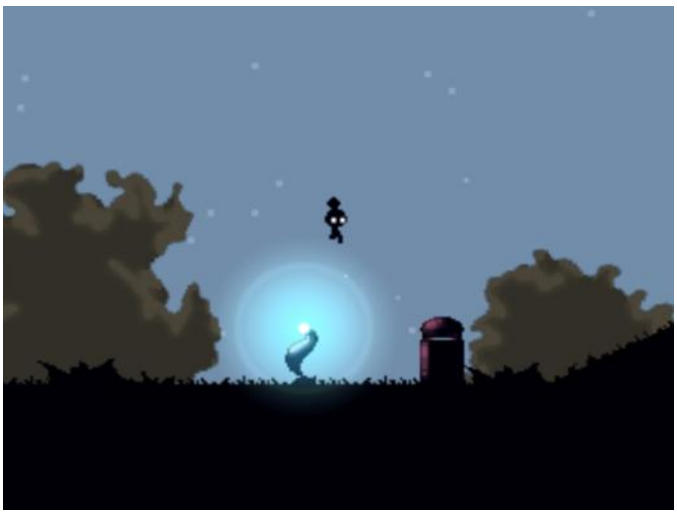
Cave Story

Dust: An Elysian Tail

Insanely Twisted Shadow Planet

Limbo

Lunnye Devitsy



Night Sky

Shadow Complex

Super Metroid

Symphony of the Night

Viviscape

9.10 Game Controls

Left – Run left

Right – Run right

Down – Crouch/slide

Space – Jump, Double jump (In midair), Glide (When Held)

Return – Menu confirm

P – Skip Cutscene

Backspace – Return to Title Screen

A – Swing melee weapon (When acquired)

S – Sprint

D – Shoot gun (When acquired), skip text.

W – Camera zoom out

9.11 Harvard Referencing guide

Available from :

http://www.staffs.ac.uk/assets/harvard_referencing_examples_tcm44-39847.pdf

Book (1 Author)

Format:
FAMILY/SURNAME, Initials. (Year of publication -in brackets) Book Title-italics orunderlined.Series title and volume -if applicable. Edition -if not the first. Place of Publication: Publisher.

Bibliography example:
NEVILLE,C. (2010)The Complete Guide to Referencing and Avoiding Plagiarism.2Nd edition. Maidenhead: Open University Press.

In-text examples:
(Neville, 2010) Neville (2010) commented that...
"Direct quotations are placed in double quotations marks" (Author's Surname, Year of Publication, p. – followed by page number –in brackets)

Computer Games/Programs

Format:
ORIGINATOR/AUTHOR. (Year of publication -in brackets) Game or program title -in italics or underlined. [Medium of item -in square brackets]. Series information and any dates or numeric information -if necessary. Place of Publication: Publisher

Bibliography example:
ELECTRONIC ARTS. (2003) The Sims.[DISC] PlayStation2. London: Electronic Arts Inc.

In-text example:
If you refer to a game or program in the body of your work, the title will need to be underlined or placed in italics:
....as can be seen in The Sims(2003)

Online video

Online video citation should commence with the name of the originator (screen name) or organisation which produced the online video.

Format:
FAMILY/ SURNAME, Initials or ORGANISATION IF NO NAMED PERSON IS AVAILABLE. (Year of distribution -in brackets) Title of Online Video –
in italics or underlined. If Applicable indicate the Number and/or title if part of a series. [Online video – in square brackets]. Date of the online video. Available from - URL. [Accessed: followed by date in square brackets].

Bibliography example:
BERKERLEY UNIVERSITYOF CALIFORNIA EVENTS. (2007) Building Academic Library 2.0. [Online Video]. 19Th November. Available from: http://www.youtube.com/watch?v=q_uOKFhoznI. [Accessed: 19Th May 2012].27

In-text:

If you refer to an online video in the body of your work, the title will need to be underlined or placed in italics:
...as can be seen in Berkeley's presentation Building Academic Library 2.0(2007)

Web document

Format:
FAMILY/SURNAME, Initials or name of website if no author is available. (Year -in brackets) Title of web document –in italics or underlined. Any numbers as indicated on the web document, i.e. if part of a series -if needed. [Online –in square brackets] Date of document –if specified. Available from -URL. [Accessed: followed by date in square brackets]

Bibliography format:
ENGLISH HERITAGE. (2005) Wind Energy and the Historic Environment. [Online] October 2005. Available from: http://www.english-heritage.org.uk/upload/pdf/Wind_Energy_(final).pdf. [Accessed:20th May 2012]

In-text example:
(English Heritage,2005) ...as indicated by English Heritage in their report Wind Energy and theHistoric Environment (2005).

Website

Format:
FAMILY/SURNAME, Initials or name of website if no author is available. (Year -in brackets) Title of website –in italics or underlined.Any numbers if website is part of a series –if needed. [Online –in square brackets] Available from -URL. [Accessed: followed by date in square brackets].

Bibliographyformat:
BBC NEWS.(2008) Factory gloom worst since 1980.[Online] Available from: http://news.bbc.co.uk/1/hi/business/7681569.stm.[Accessed: 10th June 2012]

In-Text example:
(BBC News,2008) ...as reported on BBC News (2008).