**Assignment Brief – BTEC**

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| **Programme** | | Level 3 Extended Diploma in Creative Media Production (Games Development) | | | |
| **Unit number(s) and title covered** | | Unit 73: Sound for Computer Games | | | |
| **Assignment number & title** | | Assignment Two: Sound Design and Production | | | |
| **Student name** | | *Lewis Hawkins* | | | |
| **Assessor** | | David Matravers | **Internal Verifier** | *James Shaun* | |
| **Date issued** | | *16.01.2019* | **Submission deadline** | *06.02.2019 at* ***4.30pm*** | |
| **Assessment Criteria** | **To achieve the criteria, the evidence must show that the student is able to:** | | | | **Assessor confirm met** |
| **P2** | Describe methods and principles of sound design and production using some subject terminology appropriately | | | | Y |
| **M2** | Explain methods and principles of sound design and production with reference to detailed illustrative examples and with generally correct use of subject terminology | | | | Y |
| **D2** | Comprehensively explain methods and principles of sound design and production with elucidated examples and consistently using subject terminology correctly | | | | N |

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| **Assessor feedback - 1st submission** | | | | | | | |
| Lewis,  This is a good assignment; you have explained each topic area very well and provided some good examples here. In the assignment you need to make sure you are relating each topic area back to games in some sort of way and then explaining that example in detail.  There are very little/no spelling or grammar mistakes in this assignment which is good to see; please continue to proof read your work.  I am recommending you for the re-work window.  Overall a good submission, well done. | | | | | | | |
| **Did the learner meet the original deadline or agreed extension?** | | Yes X No ☐ | | | | | |
| **Assessor signature** | H:\Digital Sig - Dave Matravers.png | | | | **Date** | | 22.02.2019 |
| **Resubmission authorised?** | | Yes ☐ No ☐ | | | | | |
| **New agreed deadline date for submission** *\* must be within 10 days of receiving original assignment back* | |  | | | | | |
| **Lead Internal Verifier signature** |  | | | **Date** | |  | |
| **Assessor feedback - Resubmission** | | | | | | | |
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| **Assessor signature** (resubmission only) |  | | **Date** | | | |  |

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| **Scenario** | | | | |
| Following on from the article you wrote for “Drowned Sound” on how sound and music is used in games they are now wanting to design and produce sound for their own games but are unsure about how to start.  You need to produce a document comprehensively explaining how they can theoretically go about planning and producing sound. | | | | |
| **Tasks and criteria covered** | | | | |
| **Task 1 – P2, M2, D2**  Within this task you have to comprehensively explain the following topic headings with elucidated examples. Your explanations should be detailed and cover the full range of the below points, your use of examples should be used to support the points you make in order to demonstrate your understanding of Sound design and production   * **Sound design methodology:** *Foley artistry; sound libraries; original development* * **Sound file formats:** *uncompressed, eg wav, aiff, au, smp, voc; lossy compression, eg mp3, ra, vox* * **Audio limitations of game platforms:** *sound processor, eg sound processor unit (SPU), digital sound processor (DSP); random access memory (RAM); storage; software development kit; sample rate; file format; audio output (mono, stereo, surround); direct audio (pulse code modulation (PCM)); adaptive delta pulse code modulation (ADPCM); file size* * **Audio recording systems:** *analogue; digital, eg MiniDisc™, compact disc (CD), digital audiotape (DAT), hard disc; computer audio workstation; multi-track systems; musical instrument digital interface (MIDI); software sequencers; software plug-ins; sound editors; sound modules; midi keyboard instruments* * **Audio sampling:** *file size constraints (resolution, bit-depth); sample rate; mono; stereo; surround*   You should take the time to ensure you cover all the **bold** headings within this task to demonstrate an appropriate range of understanding. Included alongside the bold headings are examples of some of features you may want to include in your document, but you do not have to cover all italicised headings. | | | | |
| **Evidence you must produce for this task** | | | | |
| Fully completed written document with all bold headings covered. | | | | |
| **Sources of information** | | | | |
| **Textbooks**  Baylis P, Freedman A, Procter N et al – BTEC Level 3 National Creative Media Production, Student Book  (Pearson, 2010) ISBN 978-1846906725  Baylis P, Freedman A, Procter N et al – BTEC Level 3 National Creative Media Production, Teaching Resource  Pack (Pearson, 2010) ISBN 978-1846907371  Brandon A – Audio for Games: Planning, Process, and Production (New Riders, 2004) ISBN 978-0735714137  Case A – Sound FX: Unlocking the Creative Potential of Recording Studio Effects (Focal Press, 2007)  ISBN 978-0240520322  Marks A – The Complete Guide to Game Audio: For Composers, Musicians, Sound Designers and Game  Developers, 2nd Edition (Focal Press, 2008) ISBN 978-0240810744  McCuskey M – Game Audio Programming (Course Technology, 2003)  Millward S – Fast Guide to Cubase SX (PC Publishing, 2005) ISBN 978-1870775984  Riley R – Audio Editing with Adobe Audition (PC Publishing, 2008) ISBN 978-1906005030  Sanger G et al – The Fat Man on Game Audio: Tasty Morsels of Sonic Goodness (New Riders, 2003)  ISBN 978-1592730094  **Websites**  www.audiosparx.com – online resource for digital audio  www.filmsound.org/game-audio – game audio articles  www.gamasutra.com – respected website for all things game development  www.gamecareerguide.com/features/696/adaptive\_audio\_a\_beginners\_guide\_.php?page=1 – game audio  article making sounds for video games  www.gamedev.net – a forum, with good articles on all things game development and excellent game  developer resources  www.igda.org – non-profit-making industry body, useful for research and learning support | | | | |
| **Student checklist** | | | | **Complete?** |
| Proofread work | | | |  |
| Reference / Bibliography (if applicable) | | | |  |
| All pages attached and numbered – including introduction/conclusion/front sheet | | | |  |
| **Authenticity of Evidence Student declaration** | | | | |
| I certify that the evidence submitted for this assignment is my own.  I have clearly referenced any sources used in the work.  I understand that false declaration of authenticity (i.e. plagiarised work) is a form of academic misconduct and the relevant College procedures will be instigated if I am found to be in contravention of these. | | | | |
| **Student signature** |  | **Date of submission** |  | |
| **Re-authentication of Evidence Student declaration (for resubmission only)** | | | | |
| **Student signature** |  | **Date of resubmission** |  | |

NB. Students – the assignment starts on the first page **after** these front sheets, i.e. Page 1.

* For your convenience, page numbers have been inserted into the footer. **Please keep them**.
* You may choose to add a contents table (ToC) in this section.
* Please **do** **not use text boxes** for the main body of your written answers.
* Please make sure that images/screenshots are correctly formatted, laid out and labelled. A table of Figures (ToF) may also be added if you wish.
* Make sure you use Page (or Section) Breaks whenever a new page is required. (Rather than adding large numbers of Return/Paragraph characters.) Ensure that new Section breaks continue with correct orientation and correct page numbers.
* Ensure that you have referenced your work throughout, using references in text and that you also have a reference list and full bibliography at the end of the work according to the current **Harvard Referencing** conventions. **Failure to do so will make your work more difficult to authenticate.**

**What is Sound Design Methodology?** This is the creations of sound

**Foley Artistry:** Foley Artistry is the making of sound effects using real world objects (Hitting desk could be knocking on door). This is a useful method of making sound effects as it’s easy and cheap, however it sometimes requires areas to create the sound (as it can get messy), and multiple objects to smash just to get it right.

How it’s Used in Games Development: In games a lot of sounds are either not legal to replicate in real life (Killing someone) or would require a lot of time and money to get / record. This is where Foley comes in. Using a coconut as horse hooves, or a melon as a skull, any sound can be created easily and cheaply with everyday objects. Without this, games like Grand Theft Auto, Destiny, and Monster Hunter would not be possible.

In Grand theft auto, the vehicles engine noises are recorded from real cars to achieve a realistic effect. The audio is then edited in software like Audacity and implemented into the game.

**Sound libraries:** A sound library is a collection of digital sound recordings. The can be used to download sound effects of a website to use within a project, however some (Free Sounds) are exclusively uploaded by users. This creates a copyright risk that can be hard to avoid without completely ignoring the site.

How it’s Used in Games Development: In games development, sound libraries are used by companies that either don’t have the time to record audio, or the money to make their own. Most sound effects can be acquired rather cheaply with minimal effort, and with sites that promote user uploaded sounds, there’s an endless supply.

**Original Development** is where you make the sound effects yourself. This is the best method as all effects belong to you and there’s no worry of copyright.

How it’s Used in Games Development: In games development, making most sound effects are reasonably easy, which allows both AAA and Indie game developers to take advantage to original development. It can just be coconuts for horse hooves, or slime for gore, which are both quick and cheap to make.

**Sound File Formats:**

**Uncompressed:** Uncompressed audio is used in sounds that are the most important to the game. In most games the uncompressed audio is used for dialogue, gunfire, and other sounds that are at the forefront of the experience. Examples of uncompressed files are .wav, .aif, .amp, .voc.

Some files cannot be uncompressed due to their large file size (long clips of talking for a cutscene). This means even though the audio might be important, having a few gigabytes just for a few minutes just isn’t worth it.

Types of audio used as uncompressed files are, music, important sound effects, and dialogue.

**Lossy Compressed:** This type of file that is used in less important sounds such as background music and ambient sound effects. These sounds can be compressed without any concern, since the point of these types of sounds are to not be noticed or stand out.

Examples of compressed audio files are .mp3, .ra, .vox.

Types of audio used as compressed files are, background music, ambient sounds, and background effects.

In Grand Theft Auto Rockstar used compressed audio to implement the background music and ambient effects, and uncompressed to add dialogue.

**Audio limitations of Game Platforms:**

**Sound Processor:**

What is a Sound Processer: A sound processer or sound card is a card that is used to produce the sound for the computer. Over time sound processers have become more advanced allowing for crisper and more detailed sound effects. This has allowed audio to be slightly compressed without much difference in quality.

Digital Sound Processer (DSP): A DSP is a special-purpose device that is built into the computer, to perform array-processing operations. This device translates analogue audio into digital recordings, ready to be used. They’re used for videogames since they can process data in real time, without delay.

Sound processors are used on PC to process and pass on the information of sound. They’ve improved over time to allow for more data to be processed, producing higher quality sounds.

**Random Access Memory (RAM):**

What is RAM: RAM also known as random access memory is a form of computer data storage that stores data and code currently being used. This allows the device to hold information to be recalled as reference later, however the data is deleted once the application is closed.

Applications like Word use this to allow the user to “undo” resent work in the event of a mistake. This is not exclusive to word though, nearly all applications of a similar nature and game development software use this feature.

RAM is where variables and content is stored when a games is booted-up. This is because its faster and temporary data needs to be stored here anyway.

**Sample Rate:**

Sample Rate is the number of samples of audio per second, measured in Hz. The more samples, the clearer the audio, however it does have down sides. The more samples, the larger the file size, which means games can easily become 100s of gigabytes if not monitored. It can also be a problem for rendering the audio, since rendering times can be significantly longer when trying to export from an audio editing application.

In games sample rate is determined in a similar way to compression. More important audio files will need a higher sample rate, whereas background noises don’t need high sample rates.

**Audio Output:**

Mono: Mono is single channel audio, where information is sent through only one channel for playback. All information is played in the same way through all output devices.

Stereo: Stereo is a 2-channel audio, where different sounds can be played through different output devices, such as headphones. This gives the impression the audio is coming from different places, instead of right in front of you.

Surround: Surround is a technique used mimic real-life. This is where the studio is surrounded by speakers and all play their own audio tracks. This is commonly used in cinemas but has recently made some advancements into domestic use.

**Audio Recording Systems:**

**Analogue:** The process on analogue recording requires the audio to be physically engrained onto a physical object such as, magnetic tape, wax, or vinyl. These systems tend to be less prone to errors in recording but must be stored on a physical object which is easy to damage.

**Digital:** This is the process of taking audio and converting it into data on a computer. The methods of recording are prone to errors on lower end systems but offer a greater editability, allowing the user to completely change the audio itself. With the introduction of SSDs audio stored as data on a computer system is much less likely to be corrupted or destroyed then with analogue. An example of a digital sound recorder is a microphone, which can be separate or built into a system.

**Sound Editors:** A sound editor is software that allows a user to edit and piece together audio tracks to create something for a movie or game. Software like Audacity and audition allows the user to apply overlays to the audio making it sound like its coming through a radio, under water, or from a distance. This kind of editing is very useful in game development.

**Audio Sampling:**

**File Size Constraints:** Keeping the games file size is one of a few main priorities (optimisation, organisation, file size, replayability, and enjoyability), therefore should be at the forefront of every developer’s mind. In sound design there’s several ways to decrease the file size like compression, carefully picking a file type (.mp3, .wav, .amp), and a few others. Most sounds in a game should be compressed (some more than others), but key elements to either gameplay or interest (story, lore, easter eggs) should be clear and uncompressed.

**Sample Rate:**

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Since the sample rate is the quality of sound it can be lowered to reduce file size and processing requirements, which for background sounds in games is required.

**Mono, Stereo, Surround:**

Mono: Mono is single channel audio, where information is sent through only one channel for playback. All information is played in the same way through all output devices.

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