OCR
Oxford Cambridge and RSA

Cambridge **TECHNICALS LEVEL 3**

Cambridge TECHNICALS 2016

DIGITAL MEDIA

Unit 12 – Game development

DELIVERY GUIDE

Version 1

ocr.org.uk/media

CONTENTS

INTRODUCTION

This Delivery Guide has been developed to provide practitioners with a variety of creative and practical ideas to support the delivery of this qualification. The Guide is a collection of lesson ideas with associated activities, which you may find helpful as you plan your lessons.

OCR has collaborated with current practitioners to ensure that the ideas put forward in this Delivery Guide are practical, realistic and dynamic. The Guide is structured by learning outcome so you can see how each activity helps you cover the requirements of this unit.

We appreciate that practitioners are knowledgeable in relation to what works for them and their learners. Therefore, the resources we have produced should not restrict or impact on practitioners' creativity to deliver excellent learning opportunities.

Whether you are an experienced practitioner or new to the sector, we hope you find something in this guide which will help you to deliver excellent learning opportunities.

If you have any feedback on this Delivery Guide or suggestions for other resources you would like OCR to develop, please email resources.feedback@ocr.org.uk.

OPPORTUNITIES FOR ENGLISH AND MATHS SKILLS DEVELOPMENT AND WORK EXPERIENCE

We believe that being able to make good progress in English and maths is essential to learners in both of these contexts and on a range of learning programmes. To help you enable your learners to progress in these subjects, we have signposted opportunities for English and maths skills practice within this resource. We have also identified any potential work experience opportunities within the activities. These suggestions are for guidance only. They are not designed to replace your own subject knowledge and expertise in deciding what is most appropriate for your learners.

English

Maths


Work

Please note

The activities suggested in this Delivery Guide **MUST NOT** be used for assessment purposes. The timings for the suggested activities in this Delivery Guide **DO NOT** relate to the Guided Learning Hours (GLHs) for each unit.

Assessment guidance can be found within the Unit document available from www.ocr.org.uk. The latest version of this Delivery Guide can be downloaded from the OCR website.

UNIT AIM

Games are constantly evolving from the simple early games like Pong to massive multiplayer role-playing games the market has changed significantly over time. Now, with different gaming platforms and the development of games as Apps on mobile devices, the gaming industry is growing in size and revenue.

It takes a few years of experience in a quality assurance test team, or working in project management, before a person would have the skills and knowledge to develop a full game. By completing this unit, you will gain practical skills in games development by planning and producing a functional level of a new computer game, including the creation of elements.

Unit 12 Game development	
LO1	Be able to develop a concept for a new digital game
LO2	Be able to plan a level for a new digital game
LO3	Be able to create a level for a new digital game
LO4	Be able to test a level for a new digital game

To find out more about this qualification, go to: http://www.ocr.org.uk/qualifications/cambridge-technicals-digital-media-certificate-extended-certificate-foundation-diploma-diploma-05843-05846-2016-suite

RELATED ACTIVITIES

The Suggested Activities in this Delivery Guide listed below have also been related to other Cambridge Technicals in Digital Media units/Learning Outcomes (LOs). This could help with delivery planning and enable learners to cover multiple parts of units.

This unit (Unit 12)	Title of suggested activity	Other units/LOs	
LO1	Game principles – research	Unit 1 Media products and audiences	LO4 Understand the target audiences of media products
		Unit 13 Graphic design for digital media products	LO1 Know existing graphic design products in the media
	Expansion packs/downloadable content (DLC)	Unit 1 Media products and audiences	LO4 Understand the target audiences of media products
LO2	The planning process	Unit 2 Pre-production and planning	LO2 Be able to interpret client requirements and target audience considerations
	Planning a game	Unit 2 Pre-production and planning	LO4 Be able to create and evaluate pre-production documents for a new media product
		Unit 3 Create a media product	LO2 Be able to plan and develop pre-production materials for an original media product to a client brief
	Character planning for the game concept	Unit 11 3D digital modelling	LO2 Be able to plan 3D modelled characters and a 3D environment for a client brief
	Environment planning for the game concept	Unit 11 3D digital modelling	LO2 Be able to plan 3D modelled characters and a 3D environment for a client brief
LO3	Character modelling	Unit 4 Interactive media product	LO3 Be able to create a planned interactive media product
		Unit 11 3D digital modelling	LO3 Be able to create a 3D modelled character and a 3D environment to a client brief
	Background environment modelling	Unit 4 Interactive media product	LO3 Be able to create a planned interactive media product
		Unit 11 3D digital modelling	LO3 Be able to create a 3D modelled character and a 3D environment to a client brief
	Prop modelling	Unit 4 Interactive media product	LO3 Be able to create a planned interactive media product
		Unit 11 3D digital modelling	LO3 Be able to create a 3D modelled character and a 3D environment to a client brief
LO4	Test plans	Unit 4 Interactive media product	LO4 Be able to test the new interactive media product

KEY TERMS

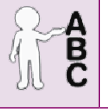
Explanations of the key terms used within this unit, in the context of this unit	
Key term	**Explanation**
Black box testing	Black box testing is a method of software testing that examines the functionality of an application without looking at its internal structures or workings.
Design specification	A design specification is a detailed document providing information about the characteristics of the game based on set criteria the developers will need to meet which may be based on a client's specification.
Downloadable content (DLC)	Downloadable content (DLC) is additional content created for a released video game. It is distributed through the Internet by the game's official publisher.
Dynamic game balancing	Dynamic game balancing or dynamic game difficulty balancing, also known as dynamic difficulty adjustment (DDA), is the process of automatically changing parameters, scenarios, and behaviours in a video game in real time, based on the player's ability, in order to avoid them becoming bored (if the game is too easy) or frustrated (if it is too hard); for example F.E.A.R. and Revenge of the Titans.
Expansion packs	An expansion pack is an addition to an existing video game. These add-ons usually add new game areas, weapons, objects, and/or an extended storyline to complete an already released game. A good example of this is a series like Sims where for example with Sims 4 there is a get to work expansion, a dine out expansion.
Functionality testing	Functionality testing identifies errors that affect a game's capabilities or how the user will experience a game.
Game design flowchart	This can be used to plan all the different paths through the game's components a player would take. What can the player see, and what can they choose to do? When they choose something, when they pick something up, what happens next?
Game development software	This is the software used to create games: for example Unity, Leadwerks, Unreal, CryEngine, Havok, Reach3dx, RPG Maker.
Genre	This is the type of game that is being designed: for example role playing games, shooter games, simulation, sports, racing etc.
Lagging	In online gaming, lag is a noticeable delay between the action of players and the reaction of the server in a video game. Although lag may be caused by high latency, it may also occur due to insufficient processing power in the client (screen-lag).
Linear gameplay	Linear gameplay presents the player with a fixed sequence of challenges that every player sees in the same sequence.
Load testing	Load testing is the process of putting demand on a computing device and measuring its response. Load testing is performed to determine a system's behaviour under both normal and anticipated peak load conditions e.g. handling multiple players.
3D models	In 3D computer graphics, 3D modelling (or modeling) is the process of developing a mathematical representation of any three-dimensional surface of an object (either inanimate or living) via specialised software.
Mood board	A mood board is an arrangement of images, materials, pieces of text, etc intended to show a particular style or concept.
Nonlinear gameplay	Nonlinear gameplay presents players with challenges that can be completed in a number of different sequences. Each player sees only some of the challenges possible, and the same challenges may be played in a different order by each player.
Platform	The actual hardware that allows you to play a game: e.g. PC, Xbox, PlayStation etc.
Player immersion	This is the engagement in the game that the player feels towards it. It is argued that there are three levels of immersion; these are basic engagement with the game, engrossment and finally total immersion (see: https://www-users.cs.york.ac.uk/~pcairns/papers/Immersion.pdf).

Explanations of the key terms used within this unit, in the context of this unit	
Key term	**Explanation**
Programming language	A programming language is a formal computer language designed to communicate instructions to a machine, particularly a computer. The most common languages in gaming are Java, Objective C and C++.
Regression testing	Regression testing is a type of software testing that tests that software that was previously developed and tested still performs correctly after it was changed or interfaced with other software. Changes may include enhancements, patches, configuration changes, etc.
Soak testing	Soak testing involves testing a system with a typical load, over a continuous period; this allows for the validation of the system under use.
Sound effects	These are the sounds that enhance the game or that are used within the game: for example the sound of footsteps, engine revving, rainfall etc.
Static props	These are non-moving or physical props in a game: for example large rocks, solid areas in a room such as fitted kitchen furniture.
Storyboarding	A storyboard is a graphic representation of how the game will unfold, shot by shot. It's made up of a number of squares with illustrations or a picture representing each shot, with notes about what's going on in the scene and what's being said in the script during that shot.
Terrain	Terrain rendering covers a variety of methods of depicting real-world or imaginary world surfaces.
Third-person	Third-person perspective puts you in direct control of a character that you can actually see in front of you. The third-person perspective usually has the player looking at his character's back for most of the game. The character is usually on the left side of the screen and the camera angle may be fixed behind the character, meaning you never see the character's face.
Wire-frame model	A wire-frame model is a visual presentation of a 3-dimensional (3D) or physical object used in 3D computer graphics. It is created by specifying each edge of the physical object where two mathematically continuous smooth surfaces meet, or by connecting an object's constituent vertices using straight lines or curves. The object is projected into screen space by drawing lines at the location of each edge.
White box testing	White box testing is a testing technique that examines the program structure and derives test data from the program code.
User acceptance testing	User acceptance testing (UAT) is the last phase of the software testing process. During UAT, actual software users test the software to make sure it can handle required tasks in real-world scenarios, according to specifications.

MISCONCEPTIONS

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	**How can this be overcome?**	**Resources which could help**
The game has to be complex	Games should have some complexity and include well-created environments and characters. The main part of gaming is the playability and addictiveness of the game. For example, Minecraft, Pokemon and Tetris have elements that make them playable (Pokemon – collecting them all), yet graphics are not the games' strength (Minecraft has very 'blocky' graphics).	http://www.cheatcc.com/extra/oneoftheseisbetterthantheother.html?utm_source=zergnet.com&utm_medium=referral&utm_campaign=zergnet_32696 http://www.makeuseof.com/tag/graphics-arent-everything-5-ugly-games-that-are-crazy-fun/
Gaming narrative	The narrative within a game is becoming increasingly important; this may be in terms of using a historical context, or could be channelling a narrow storytelling structure to one of multiple branches (as may be seen in big role-playing games). It must be remembered that not all games focus on a narrative; again Minecraft is a good example in that the player moves around the world with no real set agenda or narrative.	http://www.develop-online.net/analysis/telling-tales-the-art-of-narrative-in-games/0201176
Games can be quickly produced	Tutors could ensure that learners fully understand the game-making process including the creation of the elements within the game in order to produce a professional product. Learners may need guiding in the different software that can be used to create these elements and therefore should understand the time their creation will take, and thus – the time constraints of the project – how long they have to construct their game.	

SUGGESTED ACTIVITIES

LO No:	1		
LO Title:	**Be able to develop a concept for a new digital game**		
Title of suggested activity	**Suggested activities**	**Suggested timings**	**Also related to**
Game principles – research	Tutors could lead a discussion on the different types of games that are played by learners within the group. This could be carried out through the use of a spider diagram on a whiteboard to allow for exploration of different areas of gaming. It may be possible to provide prompts to the group; this could be in the form of areas drawn from different gaming types such as simulations, adventure, real-time strategy (RTS), role playing (RPG), puzzles, action, first person shooters (FPS), stealth shooter, educational, massively multiplayer online (MMO) or combat. This will also allow for a direction and deeper questioning and thus greater understanding being gained by the group (it will prevent them from merely looking at their favourite game, ignoring other gaming areas). During the group discussion learners could be making notes of the different gaming types that are played. Learners could be split into three or four groups, to explore different game types and answer the following questions in their groups: • What is the aim of the game? • How many players can play in the game at any one time? • How many levels does the game have? • How does the user interact with the game? Each group could pick one game to feed back to the whole group.  Useful links that discuss different types of computer games: http://www.contentedwriter.com/know-the-different-types-of-computer-games/ http://www.computermasteronline.com/computer-games/all-computer-games-types-of-computer-games/	1 hour	Unit 1 LO4 Unit 13 LO1

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Expansion packs/ downloadable content (DLC)	Tutors could lead a discussion on what DLC is and why gaming companies use DLC. Tutors could explain that downloadable content is additional to the content that is available for the video game and is distributed via the internet. It can take the form of different outfits or armour, extra storyline or maps/areas. DLC may include new game modes, objects, levels, etc. The group could discuss their own experiences with DLC and the content they have bought (and maybe compare the cost of the game with the cost of the DLC). Working in groups of three or four and from their discussions, learners could put together a presentation outlining their experiences, stating the original game price and then the cost of the additional DLC they have purchased or unlocked. Learners could carry out further research into DLC that is available for other games they have not experienced. DLC article on good and not so good content: http://www.techtimes.com/articles/117054/20151221/dlc-in-2015-the-good-the-bad-and-the-ugly.htm The DLC 'problem': http://www.gamesindustry.biz/articles/2012-08-23-roundtable-the-dlc-problem Examples of DLC: http://www.giantbomb.com/downloadable-content/3015-329/ DLC: the content question: http://www.thegaudie.co.uk/gaming-tech/the-content-question DLC revenue: http://www.gamedonia.com/blog/what-does-dlc-mean-your-games	45 minutes	Unit 1 LO4

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Linear versus non-linear (open world) gameplay	Tutors could introduce the concept of linear and non-linear gameplay and learners could reflect on the games that they play and consider if they are linear (e.g. *Modern Warfare 2, Uncharted 2: Among Thieves*) or non-linear (e.g. *GTA, Fallout 3, Minecraft, Assassin's Creed, Batman: Arkham City, The Elder Scrolls, Skyrim*). For linear gameplay every player sees the same challenges in the same order; for non-linear gameplay the challenges can be completed in in a number of different sequences; thus each gamer's experience may be different. An early example of linear play would be Sonic The Hedgehog where the player has the same challenges in order. Tutors could set up a number of games that have linear or non-linear gameplay and learners could, while others are playing the game, explain what type it is and how they come to this conclusion through gameplay examples. Learners could make notes on the games and the conclusions they reach while watching others playing the different types of games. Examples and thoughts on linear verses non-linear games: https://www.youtube.com/watch?v=EHUusgRcavk https://www.youtube.com/watch?v=TljAOsG8uyQ	45 minutes	
Dynamic game balancing (DGB)	Tutors could explain the areas where DGB can be imposed in a game: for example, the speed of an enemy, the health of an enemy, how often they appear, how often power-ups may appear etc. Learners could be asked to research this concept and also look at behaviour rules in games (dynamic scripting) and genetic algorithms. Working in pairs, learners could try playing a game that one of them has played before and the other has not. Other learners could then log the results of what they saw for each player and if these changed depending on the player's ability. Learners can present their findings in a blog – recording the results of several different games, to draw out the differences between player experiences and stating whether or not this could be due to DGB. Useful links to articles on DGB: https://www.aaai.org/Papers/AIIDE/2006/AIIDE06-005.pdf http://www.sbgames.org/sbgames2011/proceedings/sbgames/papers/comp/short/12-92348_2.pdf	45 minutes	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Software capabilities	Tutors could lead a discussion on the software that can be used to develop games. Learners could review various different games, looking at areas such as: • the use of dynamic lighting • the use of audio and audio effects • the use of music (in some cases the music around the some games is as well-known as the game itself). Learners could also consider loading time optimisation and think about their own experiences with loading times (and possible lagging due to high-end graphics, sound etc, or slower connection speeds). The findings of these reviews could be presented to the rest of the group. Useful resources: Gaming sound effects: http://designingsound.org/2010/10/aaron-marks-special-function-of-game-sound-effects/ Music in games: http://the-artifice.com/the-role-of-music-in-videogames/  Game development tools: http://www.develop-online.net/tools-and-tech/18-essential-ps4-and-xbox-one-game-development-tools/0187932	45 minutes	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Platform restrictions	Linking with the Dynamic game balancing (DGB) activity above, tutors could divide learners into smaller groups. Each group could try using a different platform and analyse the sort of games it runs and the restrictions on gameplay on that platform. Learners could be given a list of things for consideration such as: screen size and resolution, processor type, is it 2D or 3D, the interface that is used to play the game, the delivery medium (disc, cartridge, download, 4G etc). The group could create an information sheet that could be used to advise others on different platforms and what they have found regarding restrictions within the platform that they looked at. This could be presented as a review section for a larger magazine article. These websites review different platforms: http://gamingplatformssolihullcollege.weebly.com/features-and-limitations.html https://oliversmelik.wordpress.com/2014/03/20/features-and-limitations-of-pc-mobile-and-tv-game-platforms/ http://features-and-limitationsofgamingplay.blogspot.co.uk/	45 minutes	
Idea generation for a new game concept	Tutors could lead a discussion on tools that could be used for idea generation and concept visualisation for the development of a new digital game concept. Learners could be given the following mini brief to start to create their ideas for a new game concept: Brief: A local secondary school wants to promote itself to local primary schools in the area. It would like a game produced that allows pupils to explore a school, go into rooms and pick up power-ups in the form of lesson artefacts. The virtual school has an evil caretaker who does not want pupils in his school messing up his clean floors so he is trying to stop pupils moving into rooms and obtaining these artefacts. Learners could use mind mapping and visualisation diagrams to plan the type of game, considering the target audience, the platform it could run on and any DLC that could be added. This could draw together the learning from the previous activities. The learners could display their mind maps and visualisations to others in the group who could comment and provide feedback on them.	1.5 hours	

SUGGESTED ACTIVITIES

LO No:	2		
LO Title:	**Be able to plan a level for a new digital game**		
Title of suggested activity	**Suggested activities**	**Suggested timings**	**Also related to**
Visit to game creator studio 	Tutors could either arrange a visit to (or invite into the centre) a game developer/company, so that learners could observe how games are taken from the planning stage through transfer onto computer, testing and finally publication. Learners could record (video on a smartphone) their conversations with the game designers, which could then be shared with the group on returning to the centre. Learners could create a blog detailing their visit. Useful links to different gaming company websites: http://www.codemasters.com/ http://www.ninjatheory.com/wp/ http://www.pitbullstudio.co.uk/ http://www.slightlymadstudios.com/ http://www.ndreams.com/	1 hour	
The planning process	Following on from the activity above, the group could look at how games are created by watching various videos about their creation. This adds to or provides alternative access to a company if tutors are unable to organise a visit to a game development company. Tutors could show the most relevant parts of the following videos to learners, depending on the areas they are interested in: https://www.youtube.com/watch?v=u0FoYgZmlMs https://www.youtube.com/watch?v=R_TU6nHzHDM https://www.youtube.com/watch?v=fnpOetJ_-tg&index=3&list=PLGQt0zvdPYiywW9UiQjrxH7xFGcabcoCi Learners can create written notes of how a company would plan a game and compare these notes with those of the rest of the group.	1 hour	Unit 2 LO2

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Planning a game	Tutors could lead a discussion on the tools used to plan a video game such as: a game design flowchart, storyboarding, spider diagram, mood boards, rough sketches and design specifications. Based on their knowledge from studying Units 2 and 3, learners could put into practice their understanding of planning requirements, relevant to the style and content of their game concept. Learners could now continue to plan for their new game concept, using the ideas they generated for the mini brief in the Idea generation for a new game concept activity in Learning Outcome 1. When planning, learners should consider: game mechanics i.e. the rules for gameplay; brief details of each game level i.e. name, images, sounds, music, objects, characters, music, script, interconnectedness of levels and user interactions. Learners could then pitch their ideas to the rest of the group in a *Dragons' Den* role play, whereby they try to secure investors' money to fund their game idea (as they would do to a real-life client/financial backer). Useful links on the planning processes when creating a video game: http://kotaku.com/5979539/a-beginners-guide-to-making-your-first-video-game http://electronics.howstuffworks.com/making-a-video-game1.htm http://www.wikihow.com/Design-a-Video-Game	1.5 hours	Unit 2 LO4 Unit 3 LO2
Game research	Tutors could lead a discussion on how to construct a questionnaire and the difference between open and closed questions. This could enable learners to write questions that gain useful conclusions regarding the needs of an audience who are considering buying a game. Learners could construct a questionnaire to gain information on the gaming habits of an audience. They should aim to gather data on demographics e.g. age, gender, the type of games played, the platforms and the interfaces used. They could ask further questions about what would attract users to a game such as the one outlined in the mini brief in the Idea generation for a new game concept activity in Learning Outcome 1. Learners could then analyse these results and present the data to their tutor, who is acting as the client. Useful links: https://www.teachit.co.uk/attachments/21364.pdf http://www.emarketer.com/Article/Will-Gaming-Video-Audience-More-Mainstream/1011591 http://blog.gameanalytics.com/blog/how-to-expand-your-audience-with-game-accessibility.html http://www.gamesindustry.biz/articles/2013-08-21-the-audience-is-the-key-challenge-for-the-game-industry-not-technology	2 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Character and environment planning research	Tutors could divide learners into smaller groups and each group could be given different games to research and discuss. They could be asked to explore the characters and environments used in the games (games should be from different platforms with different levels of design and complexity e.g. some high-end, well-rendered games with realistic looking characters/environments and some with less complex characters and environments). In their research, learners could look at how personalities can be displayed through stance, facial characteristics and expressions. They could also examine the environments that are created in these games (including any props that may be included, both static and non-static – tutors may need to point out the difference between the two). Learners can create a blog with their findings from their research, that they can share with the whole group. Useful links to help with planning: Character: http://www.wikihow.com/Design-Your-Own-Game-Character http://www.creativebloq.com/character-design/tips-5132643 Environment: http://www.worldofleveldesign.com/categories/level_design_tutorials/how-to-plan-level-designs-game-environments-workflow.php http://www.worldofleveldesign.com/categories/cat_game_environment_design.php	1.5 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Character planning for the game concept 	Learners could use the research they have carried out in activities above and create their own plans for the mini scenario game and the characters within it. This could include the use of: a requirement specification, mood board, rough sketches, storyboarding, and design specification. Tutors could divide learners into smaller groups, with each given a different planning activity. This would need to be co-ordinated by the tutor, through meeting at different stages to ensure consistency (this would replicate some of the practices seen in the gaming industry). When planning the character, learners could consider: pencil/colour drawings of characters, 3D models, characteristics e.g. special powers, personality. They could also think about voice-over and movement of their character and the programming language they may use (e.g. Java. C, C++). Each group could then present their concept approach and game character planning documents to the group for feedback and discussion. Useful links are shown below: Mood boards: http://www.gomoodboard.com/ http://www.creativebloq.com/graphic-design/mood-boards-812470 Storyboarding: http://www.dummies.com/how-to/content/designing-video-games.html http://electronics.howstuffworks.com/making-a-video-game1.htm http://dogtrax.edublogs.org/2011/12/13/storyboarding-and-video-game-design/ Design specification: http://www.sloperama.com/advice/specs.html	1.5 hours	Unit 11 LO2

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Environment planning for the game concept	Learners could create plans for the mini scenario game and the environment they wish to create. As with the activity above, this could include the use of: a requirement specification, mood board, rough sketches, storyboarding, and design specification. Tutors could divide learners into smaller groups, with each given a different planning activity. This would need to be co-ordinated by the tutor, through meeting at different stages to ensure consistency (this would replicate some of the practices seen in the gaming industry). In planning the environment, learners could think about: the actual environment; static props (non-moving or physical props); moving props (when a character is hit by another prop or maybe moving due to external factors like wind). They could think about: textures; audio (and sound effects); 3D models; live action; pre-rendered computer graphics streamed from a video file; the programming language that will be used (e.g. Java, C, C++). Each group could then present their concept approach for the background environment and the planning documents to the group, for feedback and discussion. Useful resources: Mood boards: http://www.gomoodboard.com/ http://www.creativebloq.com/graphic-design/mood-boards-812470 Storyboarding: http://www.dummies.com/how-to/content/designing-video-games.html http://electronics.howstuffworks.com/making-a-video-game1.htm http://dogtrax.edublogs.org/2011/12/13/storyboarding-and-video-game-design/ Design specification: http://www.sloperama.com/advice/specs.html	1.5 hours	Unit 11 LO2

SUGGESTED ACTIVITIES

LO No:	3		
LO Title:	**Be able to create a level for a new digital game**		
Title of suggested activity	**Suggested activities**	**Suggested timings**	**Also related to**
How to create components 	Tutors could arrange a visit to a company that carries out the creation of computer games. This could be linked to the Visit to game creator studio activity in Learning Outcome 2. Learners could investigate the different processes that are involved in 2D and 3D modelling processes for characters and environments. They could investigate the software used, considering the tools and techniques that are employed by the company to develop games. Learners could record (video on a smartphone) the testing processes the company uses; these could then be played back to the group on returning to the centre. Learners could create a blog detailing their visit. Useful links to different gaming company websites: http://www.codemasters.com/ http://www.ninjatheory.com/wp/ http://www.pitbullstudio.co.uk/ http://www.slightlymadstudios.com/ http://www.ndreams.com/ https://en.wikipedia.org/wiki/List_of_game_companies_in_the_United_Kingdom	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Character modelling	Working from the Character planning for the game concept activity in Learning Outcome 2, tutors could lead a demonstration of the software available to create a basic character (drawn, wire-frame, 2D or 3D depending on software in the centre). Learners could then use the software to model their character. They could show the character they have created to the rest of the group to gain feedback in relation to the brief. Useful resources: Creating a character in Unity: https://docs.unity3d.com/Manual/Preparingacharacterfromscratch.html https://unity3d.com/learn/tutorials/topics/animation/character-player-bringing-your-character-life-unity https://www.youtube.com/watch?v=YSDNv7IJs5o Creating characters in Unreal: https://docs.unrealengine.com/latest/INT/Engine/Animation/CharacterSetupOverview/ https://docs.unrealengine.com/latest/INT/Engine/Content/SpeedTree/CreatingModelsForUE4/ https://www.youtube.com/watch?v=KtMbaPhi4to https://www.youtube.com/watch?v=tyYTYF0G5Kk https://www.youtube.com/watch?v=QAa_VCytgj4	4 hours	Unit 4 LO3 Unit 11 LO3

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Background environment modelling	Working from the Environment planning for the game concept activity in Learning Outcome 2, tutors could lead a demonstration of the software learners could use to create background/environment models. Learners could use the software to create their own background/environment and produce a blog detailing how they have created their background environment. Useful resources: Creating a background environment using Unity: https://unity3d.com/learn/tutorials/projects/survival-shooter/environment https://unity3d.com/learn/tutorials/projects/space-shooter/adding-a-background Background environments using Unreal: https://www.uartsy.com/course/environment-creation-in-unreal-engine-4 https://docs.unrealengine.com/latest/INT/Engine/Content/SpeedTree/CreatingModelsForUE4/ Background modelling for Unreal using Maya: http://www.digitaltutors.com/learningpath/54-Environment-Modeling-in-Maya	4 hours	Unit 4 LO3 Unit 11 LO3
Prop modelling	Working from the Character planning for the game concept activity in Learning Outcome 2, tutors could lead a demonstration of the software available to create static props, moving props, non-moving or physical props. Learners could then use the software to create their props. They could take screen captures of the process they have used and create a presentation for the rest of the group on the props and how they have created them. Useful resources: Making game objects in Blender for Unity: https://www.youtube.com/watch?v=p8Q6zgA4K4E http://www.edy.es/dev/docs/materials-and-textures-from-blender-to-unity-3d/ Making game objects in Blender for Unreal https://www.youtube.com/watch?v=aC1_m0VdKIY Importing objects from Blender into Unreal: https://www.youtube.com/watch?v=1OZr9FmaIXE	3 hours	Unit 4 LO3 Unit 11 LO3

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Voice-over and sound	Tutors could demonstrate how adding voice-overs, sound effects and music can enhance the atmosphere of the game. Learners could explain to the tutor their ideas, preparing a script detailing the atmosphere they wish to create, the sort of music they could use and any sound effects. Learners could create the voice-overs, sound effects and edit their chosen music (keeping in mind copyright restrictions). The results could be played to the rest of the group, to gain feedback and understanding on the choices made. Likely software available in centres for sound editing could include: Audacity, Auditions, Avid Pro, Reaper and Ableton Live.	1.5 hours	
Dynamic game elements	Tutors could discuss with each learner their ideas for dynamic game elements. This will enable learners to gain a deeper understanding of how these elements could be used and how a player may be better engaged with the game. Learners could then create a formal document that they could present to their client (in a *Dragons' Den* style presentation) showing how they would use dynamic game elements and how they believe these would keep the player engaged in the game and, maybe, encourage them to purchase expansion packs and DLC.	1 hour	
Further developments	Learners could discuss with the tutor how they could further develop their game through the use of downloadable content, expansion packs, second game instalments, modules, maps etc. This should relate to how they could make this desirable to the player, to ensure that they are eager to purchase the extra developments. Useful links: http://www.giantbomb.com/downloadable-content/3015-329/ http://www.techtimes.com/articles/117054/20151221/dlc-in-2015-the-good-the-bad-and-the-ugly.htm http://www.pastemagazine.com/blogs/lists/2014/02/5-dlc-that-got-it-right.html	1 hour	

SUGGESTED ACTIVITIES

LO No:	4		
LO Title:	**Be able to test a level for a new digital game**		
Title of suggested activity	**Suggested activities**	**Suggested timings**	**Also related to**
Testing a game 	If possible, tutors could arrange for a gaming company to test one example of the learners' games. This could give learners an insight into the ways in which companies test their product as it develops e.g. testing playability, looking for glitches and bugs. Learners could record (video on a smartphone) the testing process, which could be played back to the group on returning to the centre. Learners could create a blog detailing what they did on their visit. Useful links to different gaming company websites: http://www.codemasters.com/ http://www.ninjatheory.com/wp/ http://www.pitbullstudio.co.uk/ http://www.slightlymadstudios.com/ http://www.ndreams.com/ https://en.wikipedia.org/wiki/List_of_game_companies_in_the_United_Kingdom	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Test plans	Tutors could explain what a test plan is and how to use a test plan on a game. They should point out that the aim of the test plan is to ensure that all of the main parts of the game are tested and checked on a regular basis. It is thus essential that learners identify the main areas of the game that they want checked on a regular basis. The point of the test plan is to give those looking at the game a testing structure. The test cycle should look for bugs that are thought to have been fixed during the creation of the game. It should provide a play-through on all difficulties, of all levels of the game. The testing may include, for example, visual checking, audio checking, boundary checking, camera, options, area/level specific events, and objects/scenery. It could also include testing the front end and pause menu, loading and saving. Learners could use a test plan to test various games that are on the market, to gain an understanding of how to use a plan. Learners could then construct a test plan for the game they have created and allow other learners in the group to test their game using this plan. Useful resources on how to test and test planning: http://www.requirementdriventesting.com/how-to-test-plan/ https://leantesting.com/resources/how-to-write-a-test-plan/	1 hour	Unit 4 LO4
User acceptance testing (UAT)	Tutors could explain what is meant by user acceptance testing (UAT) and how it is used in the games industry. Tutors should point out the difference between functional testing and UAT: for example, that UAT consists of a set of test steps, which verify if specific requirements are working for the user. Tutors could use a certain feature – for example, changing weapons in a game – to demonstrate performance issues and any loading time of the results. Technically, a game may work and during testing, every tester can use it – but because of bad performance, no user will want to. Functional tests may be okay, usability tests may be okay as well, but any performance problems would probably lead to a failed acceptance test (for example, lagging and the time taken to change weapons could lead to the user abandoning the game). Learners could ask other learners to carry out UAT on the game they have constructed and provide feedback. A useful link on UAT: http://www.softwaretestinghelp.com/successful-user-acceptance-testing/	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Functionality testing	Tutors could explain to the group what is meant by functionality testing and how this can be used. They should explain that this can include areas such as gameplay issues for example: • problems with controls in the game, triggers that do not work as intended • problems with the game crashing or hanging • problems with graphics e.g. colours, missing graphics, graphic corruption • problems with audio or text – this may be as simple as the style does not work or the graphics do not fit in with the mood of the game. Learners could use functionality testing on their own game and detail their findings in a blog. Useful resources: Functionality testing: http://www.mogi-translations.com/gaming-services/video-game-testing/game-functional-testing/ Comparison between functionality and usability testing: https://crowdsourcedtesting.com/resources/testing-mobile-games-functionality-vs-usability/	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Tune and debug	Following on from the three previous activities, tutors could explain the use of tune and debug techniques such as: black and white box testing, soak testing, load testing, regression testing. Learners could use these techniques on their game and feed back their findings to the rest of the group. Useful resources: Black box and white box testing: http://softwaretestingfundamentals.com/differences-between-black-box-testing-and-white-box-testing/ http://technologyconversations.com/2013/12/11/black-box-vs-white-box-testing/ http://www.softwaretestingclass.com/difference-between-black-box-testing-and-white-box-testing/ Soak testing: http://www.tutorialspoint.com/software_testing_dictionary/soak_testing.htm Load testing: https://smartbear.com/learn/performance-testing/what-is-load-testing/ Regression testing: https://smartbear.com/learn/automated-testing/what-is-regression-testing/	1 hour	
What testing is suitable	Tutors could lead a discussion on the different methods of testing that have been examined and trialled. Learners could provide feedback on the methods they prefer and which worked on their game. This could enable learners to evaluate the best method for use when testing in the future. It could also indicate the resources required, in terms of timescales and personnel, in order to complete testing. Working in small groups, learners could complete a strengths and weaknesses table for each testing technique and then feed back their findings to the whole group.	1 hour	

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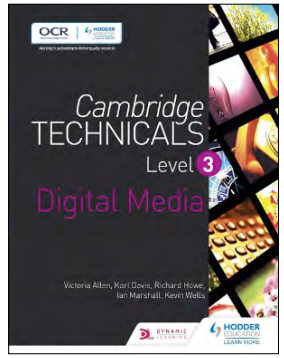

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