

Cambridge TECHNICALS LEVEL 3

IT

Cambridge
TECHNICALS
2016

Unit 15 – Games design and prototyping DELIVERY GUIDE

Version 2

CONTENTS

Introduction	3
Related Activities	4
Key Terms	5
Misconceptions	6
Suggested Activities:	
Learning Outcome (LO1)	7
Learning Outcome (LO2)	10
Learning Outcome (LO3)	12
Learning Outcome (LO4)	14

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 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

Gaming is a continuously developing market. There are a number of platforms available for game developers to release games that they have designed and developed. This unit will help you develop skills in designing and developing a prototype for a simple game. It will enable you to consider the logic of the programming structures required, as well as the interface design. You will then build a prototype in order to demonstrate an element of your game.

This unit is optional within the Application Developer specialist pathway. Games designers and developers design and develop games across a wide range of applications and platforms.

Unit 15 Games design and prototyping

LO1	Understand the principles of game design and prototyping
LO2	Be able to develop game concepts
LO3	Be able to develop game prototypes
LO4	Be able to present and evaluate game concepts

To find out more about this qualification please go to: <http://www.ocr.org.uk/qualifications/cambridge-technicals-it-level-3-certificate-extended-certificate-introductory-diploma-foundation-diploma-diploma-05838-05842-2016-suite>

The activities within this teaching and learning resource must not be used for summative assessment purposes. As part of our teaching we expect support to be given to your learners; such support is not permissible for summative assessment and is likely to be considered malpractice.

Cambridge
TECHNICALS
2016

2016 Suite

- New suite for first teaching September 2016
- Externally assessed content
- Eligible for Key Stage 5 performance points from 2018
- Designed to meet the DfE technical guidance

RELATED ACTIVITIES

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

This unit (Unit 15)	Title of suggested activity	Other units/LOs	
LO1	Experiencing different game genres	Unit 1 Fundamentals of IT	LO2 Understand computer software
		Unit 15 Games design and prototyping	LO2 Be able to develop game concepts
	Characters in games	Unit 15 Games design and prototyping	LO2 Be able to develop game concepts
	Prototyping a game	Unit 2 Global Information	LO4 Understand the legal and regulatory framework governing the storage and use of global information
		Unit 3 Cyber security	LO2 Understand the issues surrounding cyber security
		Unit 15 Games design and prototyping	LO3 Be able to develop game prototypes
		Unit 21 Web design and prototyping	LO3 Be able to create prototype websites for an identified client
LO2	Scoring systems	Unit 15 Games design and prototyping	LO3 Be able to develop game prototypes
	User interface design	Unit 21 Web design and prototyping	LO3 Be able to create prototype websites for an identified client
LO3	Testing	Unit 9 Product development	LO3 Be able to implement and test products
	Beta testing	Unit 15 Games design and prototyping	LO4 Be able to present and evaluate game concepts
LO4	Presenting a game idea	Unit 21 Web design and prototyping	LO4 Be able to present the interactive website concept to an identified client
	Effective feedback	Unit 15 Games design and prototyping	LO3 Be able to develop game prototypes

KEY TERMS

Explanations of the key terms used within this unit, in the context of this unit

Key term	Explanation
Achievement	The ways a person can score or complete tasks in a game.
Alpha testing	Alpha testing is the final testing before software is released to the general public. The first phase of alpha testing is where the software is tested by the in-house software developers, whereas the second phase is conducted by an in-house quality assurance group in an environment similar to that of the end user.
Array	An array is a series of objects which are all of the same size and type. Each object within an array is called an array element. Each element has the same data type and is stored contiguously in memory. An array can have more than one dimension e.g. a one-dimensional array is called a vector whereas a two-dimensional array is called a matrix.
Attributes	The characteristics or features that a character in a game has e.g. their colour, the special skills they have.
Audience	The people the game is intended for. The game will contain design features aimed at a certain age group or type of game player.
Beta testing	Beta testing is the final phase of testing and is carried out by a sample of the intended audience.
Black Box testing	Black Box testing is where the tester is only aware of the inputs and expected outcomes of the software and not how the program arrives at these outcomes. Sometimes known as behavioural testing. In other words it tests the functionality of the software.
Character	Any item in a game that a person can play as and control, or that they can interact with.
Flow chart	A diagram that can be used to show the pathways that the logic of a game can take.
Prototype	All or part of a game that is in development or user testing. This could be a level of a game, a certain room, particular task or achievement.
Pseudocode	A representation of code or a program that is not written in any particular programming language, but written in English statements.
Purpose	The aim or goal of a game. The reason why a user would play the game.
Testing	Performing tasks that check the functionality of each part of the program for all eventualities.
User interface	The way that a user interacts with a game. The graphics they see, use and interact with when playing the game.
White Box testing	White Box testing is a testing technique that examines the program structure and derives test data from the program logic/code.

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 only achievement in games is the main scoring system	Learners may think that the only achievement that exists in a game is the main scoring system. They may not recognise that how quickly a level can be completed, collecting all of the scoring parts on a level, completing a level without losing a life, can all be methods of achievement in a game as well.	https://en.wikipedia.org/wiki/Achievement_(video_gaming)
A prototype needs to be the whole game	Learners may think that they need to make the whole of a game for their prototype. They may not realise it can just be a working part of the game. This could be a particular level of the game, or a particular task to complete in the game. The prototype should show the general concept of the game and give a feel for it, but does not have to be the game in its entirety.	
The user interface is not as important as the game play	Learners may neglect the design of their interface as they focus too much on the game play. One of the more irritating elements of game play though is not understanding how to find something or look at something because the interface is not well designed. Many games developers follow certain mental models when designing their user interface and users may want to explore these.	http://gamedev.tutsplus.com/tutorials/game-ui-by-example-a-crash-course-in-the-good-and-the-bad--gamedev-3943

SUGGESTED ACTIVITIES

LO No:	1		
LO Title:	Understand the principles of game design and prototyping		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Experiencing different game genres	<p>It is important for learners to understand that there are different game genres. The genre of the game can often reflect the purpose. Learners will need to experience different game genres to gain a range of gaming experiences.</p> <p>Learners could identify four different genres of game to explore. They could identify a game that they can access and play in each of the genres. Possible genres learners could consider are:</p> <ul style="list-style-type: none"> • Arcade (Pacman, Space Invaders) • Platform (Sonic the Hedgehog, Super Mario) • Strategy (Tetris, Civilization) • Adventure (Minecraft, Tomb Raider) • Puzzle (Portal, World of Goo) • FPS/TPS (Unreal Tournament, Halo). <p>Tutors could direct learners to some online versions of games. The following website has a range of versions of some classic video games: http://www.freevideogamesonline.org/</p> <p>Learners could spend five minutes playing each game to familiarise themselves with the game play.</p>	1 hour	Unit 1 LO2 Unit 15 LO2
Identifying the audience and purpose of a game	<p>Learners could choose four different games to explore. They could spend five minutes playing each game to experience the game play.</p> <p>Tutors could ask learners to identify the audience and purpose of each game. They could then ask them to describe the features of each game that make it suitable for the particular audience or purpose that they have identified.</p> <p>Learners may also want to consider if there are any common features across the games. They could consider whether the features are related to a common element of audience or purpose, or whether all games have some common features.</p>	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Characters in games	<p>Learners could choose four different games to explore. They could spend five minutes playing each game to experience the game play.</p> <p>Tutors could ask learners to discuss the following questions:</p> <ul style="list-style-type: none"> • What do you know about the main character after five minutes of game play? • How does the main character move and interact in the game? • What do you think is the most important feature of the main character? <p>The discussion could take place as a whole group or learners could work in pairs.</p>	30 minutes	Unit 15 LO2
Achievement in games	<p>Learners could choose four different games to explore. They could spend five minutes playing each game to experience the game play. When playing each game learners should focus on the scoring system in the game.</p> <p>Tutors could ask learners to discuss the following questions:</p> <ul style="list-style-type: none"> • How do you score/get points in the game? • Is this the only method of achievement in the game? Are there any others? • What do you think is the most important method of achievement? Would this be the same for everyone who played it? <p>The discussion could take place as a whole group or learners could work in pairs.</p>	30 minutes	
Prototyping a game	<p>Tutors could ask learners to work in pairs or groups to prepare a five-minute presentation about prototyping a game. Learners will need to research prototyping games to create their presentation and could address the following questions:</p> <ul style="list-style-type: none"> • What does it mean to prototype a game? • What is the purpose of prototyping a game? • How can a prototype of a game be used? • What benefits are there to creating a prototype for a game? <p>Learners could use the following resources in their research:</p> <p>https://www.nyfa.edu/student-resources/getting-the-most-out-of-your-prototype-game/</p> <p>Ham, Ethan (2015) <i>Tabletop Game Design for Video Game Designers</i>, Chapter 15 Prototyping video games, Focal Press</p> <p>http://video.mit.edu/watch/paper-prototyping-your-game-episode-1-part-1-5514/</p>	2 hours	Unit 2 LO4 Unit 3 LO2 Unit 15 LO3 Unit 21 LO3

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Analysing why we game	<p>In order to create games, it is important to understand why we game. Learners could research the effects of gaming and the gamification of things such as everyday activities. They could consider the following:</p> <ul style="list-style-type: none"> • Why do we play games? • Do all people play games for the same reason? • Do we all like to play the same type of games? • Why do we get enjoyment out of playing games? <p>This activity could be done in groups as a research project. Learners could be asked to present the findings from their research including what they will look to include in their own games as a result.</p> <p>Learners could use the following article in their research: http://www.huffingtonpost.com/greg-perreault/why-do-we-love-video-game_b_4740425.html</p>	2 hours	

SUGGESTED ACTIVITIES

LO No:	2		
LO Title:	Be able to develop game concepts		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
The rules	<p>Tutors could ask learners to consider two of the games they investigated when experiencing different game play. They could ask learners to list the rules of the world/level of the game they play.</p> <p>Once learners have two sets of rules they can compare them. After comparing them learners could write two more rules for each game to change the game play slightly. They could discuss in pairs what effect this would have on the game.</p> <p>Learners could use the following resource in thinking about creating rules: https://www.makeschool.com/gamernews/298/5-basic-elements-of-game-design</p>	30 minutes	
Scoring systems	<p>Tutors could ask learners to consider one of the games they have played. They could focus on the scoring system of the game and how a player scores in the game.</p> <p>Learners could draw a flow chart to represent the scoring system of their chosen game. They could expand this to include all methods of achievement in the game. They could then design another method of achievement to add to the game and represent this in their flow chart.</p> <p>Learners could use the following resources to understand more about achievement in games: http://gamedevelopment.tutsplus.com/articles/make-them-work-for-it-designing-achievements-for-your-games--gamedev-3371</p> <p>Rogers, Scott (2014) <i>Level Up!: The Guide to Great Video Game Design</i>, John Wiley & Sons</p>	1 hour	Unit 15 LO3
Character design	<p>Tutors could ask learners to work in groups. Learners could identify three characters to focus on from their game play. They could consider the following in a group discussion:</p> <ul style="list-style-type: none"> • List the attributes of each character • How do the attributes compare? • What do you think makes a good character? • What is important about a character in a game? <p>Learners could create a new character for a game from what they have learnt in their discussion. They could present their character design to the rest of the group.</p>	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
User interface design	<p>Tutors could ask users to consider the user interface of a game they have played. They could ask learners to consider the design of the interface and what has been designed into it to make it suitable for the intended audience and purpose.</p> <p>Learners could use the following resources in their research:</p> <p>http://gamedevelopment.tutsplus.com/tutorials/game-ui-by-example-a-crash-course-in-the-good-and-the-bad--gamedev-3943</p> <p>https://gamedesignconcepts.wordpress.com/2009/08/24/level-17-user-interfaces/</p>	2 hours	Unit 21 LO3
Redesigning for a different audience and purpose	<p>Once learners have identified these interface features, they could redesign the interface for a different audience. They could think about the features they have identified and how they could change these to make the game appeal to a different audience, or to give the game a different feel.</p> <p>They could put together a mock-up of the redesign of the interface and annotate this to show what they have changed and why they have chosen to make those changes.</p>	2 hours	
Looking at progression	<p>In a video game, there can sometimes be one set progression through the game, and only that particular progression can be followed. This is called linear progression. There can also be a situation where the player can choose how to progress through the game, as there are different paths and different storylines available. This is called non-linear progression.</p> <p>Learners could look at the merits of linear and non-linear progression through a game.</p>	30 minutes	

SUGGESTED ACTIVITIES

LO No:	3		
LO Title:	Be able to develop game prototypes		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Navigation in a game	<p>Tutors could ask learners to think about the navigation requirements of Pacman.</p> <p>Learners could draw a simple flow chart to represent the navigation system to begin. Once they have a flow chart they could begin to develop this into pseudocode for the navigation of the character.</p> <p>When learners have their pseudocode developed, they could think about how they will create an efficient program for the navigation of the character. They could think about how they could use iteration to navigate their character. They could then develop this into thinking about how they could use a procedure to make their program more efficient.</p>	1 hour	
Jumping	<p>Tutors could ask learners to research how to jump in a game. They will need to research how games make use of gravity and also how the programming environment they intend to use replicates the use of gravity.</p> <p>Once learners understand how to make a character jump, they could develop a program to do this with their Pacman character.</p>	1 hour	
Creating scoring	<p>Learners could take the flow chart they created in the design section, for the scoring system, and build this into pseudocode. Once they have established their pseudocode they can then begin to create a program to carry out their scoring system.</p> <p>They may want to use the Pacman character they have designed a navigation system for. They may also need to add in other characters or items into their program to be able to create the scoring system.</p>	2 hours	
Tracking achievement	<p>Learners could use the techniques learnt when creating a scoring system and expand this to include two other methods of achievement. They could consider tracking lives and tracking the collection of other items to gain a reward.</p>	2 hours	
Testing	<p>Tutors could ask learners to research how to carry out testing to a good standard, making sure that all elements are thoroughly tested. They could also research the importance of testing and what happens when testing is carried out properly.</p> <p>Learners could create a testing table to fully test the navigation program and scoring program they have made if they have completed the activities above.</p>	1 hour	Unit 9 LO3

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Beta testing	<p>Learners could plan a beta test for their game prototype. They should consider what kind of things they would want their tester to comment on and what kind of things they would want them to check.</p> <p>They could set this up in a survey type of format so that they could analyse the results afterwards. They could use a platform such as SurveyMonkey to create their beta test survey.</p>	2 hours	Unit 15 LO4

SUGGESTED ACTIVITIES

LO No:	4		
LO Title:	Be able to present and evaluate game concepts		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Game reviews	Tutors could ask learners to find two reviews online of a game. Learners could study the reviews and note the feedback about how the game could be improved. They could then create a five-minute presentation about the amendments they would make to the game, acting on the feedback from the reviews.	1 hour	
Presenting a game idea	<p>Tutors could ask learners to research how to create an effective pitch for a game prototype. They could research what they need to be included in their pitch and how to present themselves, as well as their ideas, effectively.</p> <p>In order to gain an understanding of what might be included in a presentation of this kind, learners could watch videos of previous game presentations at large gaming events e.g. E3.</p> <p>Learners could use the following resource: https://www.e3expo.com/</p>	1 hour	Unit 21 LO4
Game modifications	<p>Tutors could ask learners to research what is meant by a game mod (game modification). Learners could write a report that describes three game mods and how they improved the game play of the original game.</p> <p>This could be further extended to include two game mods that people did not find enjoyable and considering why this might be.</p> <p>Learners could use the following resource in their report: http://www.pcgamesn.com/the-100-best-mods-on-pc</p>	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Did they match up?	<p>Learners could consider two of the games that they originally chose to play. They could use research, using the internet, to find out what the original marketing materials stated were the selling points of the game. They could then evaluate both games against the selling points and marketing and consider the following:</p> <ul style="list-style-type: none"> • Has it met the intended marketing points? • What features does the game have that helps it meet its design requirements? • Does it create the game play that it was designed for? • Suggest a way that it could have been improved to further meet the intended design. <p>Learners could create a video of the game play for each of the games and provide a voice-over evaluation of each considering the points above.</p>		
Effective feedback	<p>Learners could look at what they would want to gain feedback about regarding their game. When we ask people for feedback, if we do not provide them with some form of structure to the feedback that we want them to provide, they may not consider the things that we want them to consider.</p> <p>As an extension to the beta testing survey that learners created in developing their prototype, they could create a secondary survey that asks players to compare the requirements specification and design created for the game against a prototype game they have created. They could design their survey questions to ask the player whether each of the requirements have been met.</p>	2 hours	Unit 15 LO3



We'd like to know your view on the resources we produce. By clicking on the 'Like' or 'Dislike' button you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click 'Send'. Thank you.

Whether you already offer OCR qualifications, are new to OCR, or are considering switching from your current provider/awarding organisation, you can request more information by completing the Expression of Interest form which can be found here: www.ocr.org.uk/expression-of-interest

OCR Resources: *the small print*

OCR's resources are provided to support the delivery of OCR qualifications, but in no way constitute an endorsed teaching method that is required by OCR. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources. We update our resources on a regular basis, so please check the OCR website to ensure you have the most up to date version.

This resource may be freely copied and distributed, as long as the OCR logo and this small print remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content:
Cover image: Konstantin Sutyagin/Shutterstock.com
Square down and Square up: alexwhite/Shutterstock.com

Please get in touch if you want to discuss the accessibility of resources we offer to support delivery of our qualifications: resources.feedback@ocr.org.uk

Looking for a resource?

There is now a quick and easy search tool to help find **free** resources for your qualification:
www.ocr.org.uk/i-want-to/find-resources/

ocr.org.uk/it

OCR Customer Contact Centre

General qualifications

Telephone 01223 553998

Facsimile 01223 552627

Email general.qualifications@ocr.org.uk

OCR is part of Cambridge Assessment, a department of the University of Cambridge. *For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored.*

© **OCR 2018** Oxford Cambridge and RSA Examinations is a Company Limited by Guarantee. Registered in England. Registered office 1 Hills Road, Cambridge CB1 2EU. Registered company number 3484466. OCR is an exempt charity.



Cambridge
Assessment

