Pearson BTEC

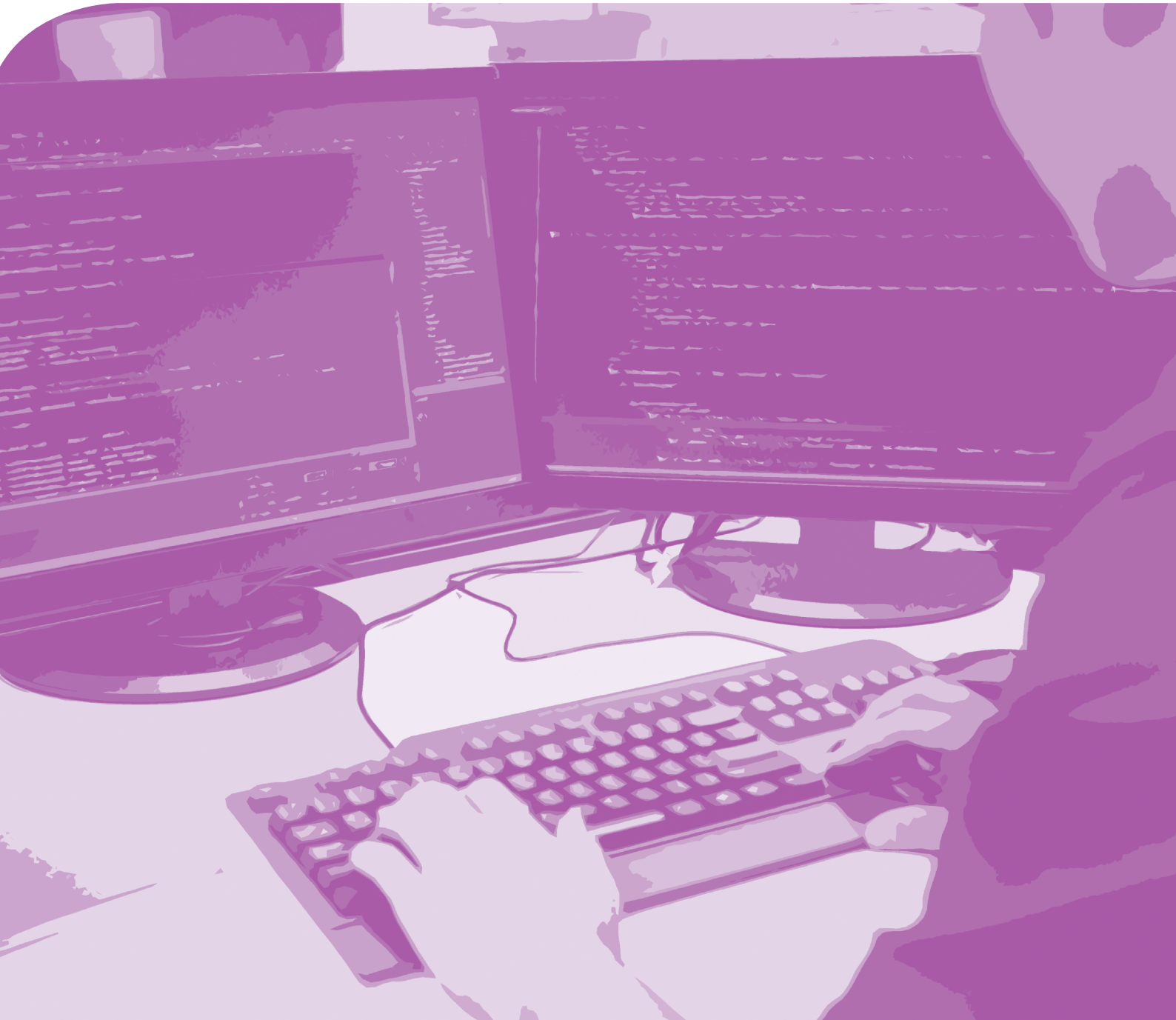
Pearson BTEC Uzbekistan Level 4 Qualifications in

Software Development

Unit 8: Computer Games Development

Teacher Resources

Issue 1



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Contents

Introduction

This resource booklet is a companion to the BTEC Uzbekistan Level 4 Qualifications in Software Development. The specification tells you what must be taught and what must be assessed. This resource booklet gives you suggestions and ideas as to how you can do this.

This booklet gives you ideas for teaching and learning, including practical activities, realistic scenarios, ways of involving employers in delivery and of managing independent learning, and how to approach assessments. The booklet also shows you how the specification content might work in practice and inspires you to start thinking about different ways of delivering your qualification.

This resource booklet gives you:

- guidance on how to deliver the unit
- recommended resources to support the delivery of the unit
- a scheme of work that show the topics, activities and assessments covered in the unit
- lesson plans with detailed guidance on how to deliver the lessons in the unit

The information in this resource booklet has been put together by teachers who have been close to the development of the qualification and so understand the challenges of finding new and engaging ways to deliver BTEC qualifications.

The delivery guidance in this booklet gives you information on what you need to consider as you plan the delivery of the unit. This includes suggestions on how to approach the learning aims and unit content, as well as ideas for interesting and varied activities. You will also find tips and ideas on how to plan for and deliver your assessments.

We have included a list of carefully selected resources for the unit. This resource list offers suggestions for books, websites and videos that you can direct your learners to use and/or that you can use to complement delivery.

Unit 8: Computer Games Development

Delivery guidance

Approaching the unit

The purpose of this unit is to provide learners with practical experience of designing and developing computer games. Learners will spend time investigating the computer games industry before assuming the role of a software developer within the games industry and analysing popular genres to design and develop their own computer games. Learners should have access to adequate game development environments (such as those stated in the unit specification) in order to complete the assessments for this unit. Preferably, they should have access to a selection of environments, as this will enable greater opportunity for comparison with development options.

Delivering the learning aims

For Learning aim A, begin by discussing computer gaming in general. Learners could talk about their favourite computer games and genres. However, be careful here as there is potential for learners to get carried away with talking about their favourite games. To this end, try to focus learners on why particular games are their favourites. What makes them come back to these games? This could lead to discussions about different kinds of player, which could include age range, gender or casual versus immersive gamers, etc. At this point, you could also discuss the different ways of producing games, for example, mainstream publishers, 'indies' or free-to-play.

After discussing games and genres, move on to how games are played. Do learners prefer multiplayer or single-player games? Discuss multiplayer systems and the way they are implemented and maintained.

In Learning aim B, learners design a computer game. As with any software design, they should be familiar with the scope of the design. You should guide learners in the process of choosing appropriate models to use in their designs. Learners should be familiar with techniques used in game design and be confident in the application of the ones that they will use in their own designs. Throughout this learning aim and Learning aim C, stress the importance of knowing the stages of software development, including design (in Learning aim B), and development and testing (in Learning aim C). Ensure that learners understand what is required in the analysis and design of a computer game, and in the management of a software development project.

Set aside time for learners to review their designs with their peers and, if possible, practitioners. They could do this through presentations or seminars, where they could ask questions and make suggestions for improvement. In Learning aim C, give learners as much practical experience as possible. Introduce the use of development environments early on and allow learners time to experiment with the tools available. Ensure that you give learners the opportunity to develop their skills using their chosen environment so that they can make use of the advanced features listed in the unit specification. In Learning aim C, learners will complete their development projects. You should ensure that they are proficient with the development and testing stages of software development. Allow time for learners to review their own draft computer games and those of their peers. Try to do this late enough that learners have working games, but early enough that they will have time to make refinements based on the feedback they receive.

Getting started

This gives you a starting place for one way of delivering the unit. It is based on the recommended assessment approach given in the specification.

Unit 8: Computer Games Development
Introduction Computer games now cover personal computers, consoles, and mobile devices such as handheld consoles, phones, tablets and wearable technologies. With the spread of devices available for use, the computer games industry is continually growing and, as such, many computer game developments are as large a production as blockbuster movies, involving many contributors. As game developers, learners will need to meet client requirements and understand the limitations and potential of different gaming solutions.
Learning aim A – Understand the principles of computer games design
• In Learning aim A, learners will investigate computer games, genres and the technologies available to computer game developers. Learners should be equipped with a range of skills and knowledge before starting the assessment – do not use the assessment as a vehicle to teach the content.

Unit 8: Computer Games Development
Learning aim B – Design a computer game to meet client requirements
• You should guide learners in the process of choosing appropriate models to use in their designs. Learners should be familiar with techniques used in game design and confident in applying the ones that they will use in their own designs. In groups, learners could build on earlier discussions to consider the type of games they would like to design. Whether learners do the design work individually or in groups, they will gain useful insight from group discussions. • Learners must be familiar with software development and the design documentation that is expected of them. They must be able to design the visuals, story, gameplay and algorithms for their game. To this end, they should be confident in the use of storyboards, diagramming techniques and pseudocode. • Learners should review their designs with their peers and refine as necessary. Learners could present their design concepts for their computer games to the class and ask for comments and suggestions for improvement. They should make a note of any useful feedback given along with details of any refinements required.
Learning aim C – Develop a computer game to meet client requirements
• In Learning aim C, learners develop their computer game from the designs created in Learning aim B. • Learners must know how to develop software from a design schematic, which should include how to apply graphical rendering and vectoring or add physics to their virtual environments. Learners should be able to produce a prototype of their games using appropriate tools and techniques. They should be able to use several game development environments, so that they can build up their skills. • Learners should be confident in the use of game engines to develop visual styles. They should be able to optimise for certain input methods, integrate assets and include advanced features such as artificial intelligence, 3D rendering and multiplayer capabilities in their designs. • Learners should be able to test their computer game for functionality, playability, compatibility and stability. These tests should employ a variety of methods, including white box and black box methodologies. Any issues should be rectified. • Learners should demonstrate their games to an audience and gather feedback from sample players to identify areas needing improvement and the overall level of acceptance and playability.

Details of links to other BTEC units and qualifications

This unit links to:

- Unit 1: Introduction to Programming
- Unit 2: Software Analysis and Design
- Unit 4: Programming Using Different Coding Paradigms
- Unit 6: Digital Graphics and Animation.

Resources

Websites

www.html5gamedevelopment.com/html5-game-tutorials

Tutorials for game development in HTML5

https://unity3d.com/learn/tutorials

Tutorials for Unity game engine

https://wiki.unrealengine.com/VideosVideo

Tutorials for Unreal Engine technology

http://sandbox.yoyogames.com/make/tutorialsYoYo

Tutorials for game development in Game Maker

Pearson is not responsible for the content of any external internet sites. It is essential for teachers to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that teachers bookmark useful websites and consider enabling learners to access them through the school/college intranet.

Scheme of work

Unit	Unit 8: Computer Games Development
Guided Learning Hours	120
Number of lessons	40
Duration of lessons	3 hours
Links to other units	• Unit 1: Introduction to Programming • Unit 2: Software Analysis and Design • Unit 4: Programming Using Different Coding Paradigms • Unit 6: Digital Graphics and Animation

Key to learning opportunities			
AA	Assessment Activity	**RS**	Revision Session
GS	Guest Speaker	**V**	Visit
IS	Independent Study	**WE**	Work Experience

#	Topic	Lesson type	Suggested activities	Resources
1	A1 Genres and social trends in computer gaming	IS	• **Teacher-led discussion:** To introduce the unit, initiate a discussion on the genres and social trends in computer gaming. • **Teacher presentation:** Give an overview of the different genres and social trends in computer gaming. • **Individual activity:** Learners explore multiple computer games to identify their genres and social trends. • **Plenary**: Summarise the lesson and use oral questioning to confirm learners' understanding.	Dry wipe board or flip chart to collate feedback Teacher presentation Computer games (online or console-based)
2	A2 Visual style in computer gaming	IS	• **Teacher presentation:** Give an overview of the different visual styles in computer gaming. • **Individual activity:** learners to research visual styles in modern computer games. • **Plenary**: Summarise the lesson and use oral questioning to confirm learners' understanding.	Dry wipe board or flip chart to collate feedback Computers with internet access Presentation on visual styles
3	A3 Gameplay in computer gaming	IS	• **Teacher-led discussion:** Discuss the different gameplay features and principles. • **Paired/small-group activity:** Learners should research and document the different gameplay features and principles used in modern games. Then learners feed back to whole class. • **Plenary:** Summarise the lesson and use oral questioning to confirm learners' understanding.	Dry wipe board or flip chart to collate feedback Computers with internet access

#	Topic	Lesson type	Suggested activities	Resources
4	Learning aim A assessment	AA/IS	• **Lead-in:** Introduce the assessment Task 1 (see Assessment Workbook), detailing the main assessment criteria, deadline and submission criteria. • **Individual assessment activity:** Using the Assessment Workbooks, learners complete Task 1.	Computers with internet access Assessment Workbook
5–6	B1 Design documentation for a mobile app – Visual style	IS	• **Teacher-led discussion/presentation:** Understanding the visual style design process. • **Individual activity:** Learners design solutions against given scenarios making use of visual styles. • **Plenary:** Discuss how learners coped with the activity and use oral questioning to identify any gaps in understanding.	Flip chart or similar for learners to record discussions and ideas Presentation on the visual style design process Learner work from previous lesson Scenarios Computers with internet access

#	Topic	Lesson type	Suggested activities	Resources
7–8	B1 Design documentation for a mobile app – gameplay principles	IS	• **Teacher-led discussion/presentation:** Understanding gameplay principles. • **Individual activity:** Use current games to design the gameplay features. • **Plenary:** Discuss how learners coped with the activity and use oral questioning to identify any gaps in understanding.	Flip chart or similar for learners to record discussions and ideas Presentation on gameplay principles Learner work from previous lesson Access to current games Computers with internet access
9	B1 Design documentation for a computer game	IS	• **Teacher presentation:** Give an overview of the design documentation required for computer game development. • **Individual activity:** Undertake a simple practical task to produce standard design documentation based on a scenarios. Learners to review designs with other groups. • **Plenary:** Summarise the lesson and use oral questioning to confirm learners' understanding.	Presentation on design documentation Learner activity material Computers with internet access Dry wipe board or flip chart to collate feedback

#	Topic	Lesson type	Suggested activities	Resources
10–11	B1 Design documentation for a mobile app – Application of game play principles	IS	• **Teacher-led discussion/presentation:** Understanding the application of game play principles. • **Individual activity:** Use pre-defined code, flow charts, pseudocode, data dictionary and storyboards to create a gamed design for a given scenario. • **Plenary:** Discuss how learners coped with the activity and use oral questioning to identify any gaps in understanding.	Flip chart or similar for learners to record discussions and ideas Learner work from previous lesson Scenarios Computers with internet access
12–13	C1 Programming constructs – Event driven	IS	• **Teacher-led discussion**: Description and examples of event driven programming characteristics. • **Individual activity:** Learners create a simple game using event driven functionality. • **Small group activity:** Learners should discuss their games. They should be prepared to explain/justify their choices. Learners can provide peer feedback.	Computers with IDE installed Dry wipe board or flip chart to collate feedback

#	Topic	Lesson type	Suggested activities	Resources
14–15	C1 Programming constructs – object-oriented	IS	• **Teacher-led presentation/discussion**: Description and examples of object-oriented programming characteristics. • **Individual activity**: Learners create a simple game using object-oriented functionality. • **Small group activity**: Learners should discuss their games. They should be prepared to explain/justify their choices. Learners can provide peer feedback.	Computers with IDE installed Dry wipe board or flip chart to collate feedback
16–19	C2 Gaming engines	IS	• **Teacher presentation:** Discuss different gaming engines and how these can be used to develop games. • **Teacher demonstration:** Introduce the learners to a gaming engine, focusing on: o graphic rendering o animation systems o artificial intelligence o level design o assets. • **Individual activity:** Learners develop simple games using a gaming engine. • **Plenary:** Learners should discuss their games. They should be prepared to explain/justify their choices. Learners can provide peer feedback.	Computers with internet access/gaming engine installed Teacher presentation

#	Topic	Lesson type	Suggested activities	Resources
20	C3 Testing a computer game	IS	• **Teacher presentation:** Explain what testing involves for computer games • **Individual activity**: Give the learners a number of different scenarios and they have to develop and test a game solution for each scenario.	Teacher presentation and notes Computers with IDE and game engine installed Scenarios for use of develop and testing
21–23	Learning aim C – computer game development practice	IS	• **Lead-in:** Explain to learners that over the next three lessons they will complete a task that will allow them to practise all that they have learned so far in this unit. • **Individual activity:** Learners create a detailed solution for the game. • **Small group activity:** Learners should discuss their solutions. They should be prepared to explain/justify their choices. Learners can provide peer feedback.	Computers with IDE and game engine installed Small dry wipe boards for paired activity/basic stationary for making notes Problem brief

#	Topic	Lesson type	Suggested activities	Resources
24–29	Learning aims B and C Practice assessment	IS/AA	• **Lead-in:** Explain to learners that over the next six lessons they will complete a practice assessment to prepare them for their final assessment. • **Individual assessment activity:** Learners respond to a practice assessment like the final assessment. ***Note**: The practice assessment used should follow a similar structure to the final assessment and should be graded against the same criteria. However, the assessment used **must not** be the same one that will be used to assess their final grade for the unit.*	Computers with IDE and game engine installed Practice assessment Test plan template
30	Practice assessment feedback	IS/AA	• **Lead-in:** Provide learners with the marked work and feedback on the work from the practice assessment (lessons 24–29). • **Individual assessment activity:** Learners read through the marked work and identify areas that need to be improved. Learners complete individual study on these areas.	Computers with IDE and game engine installed Learner work from lessons 24–29 Teacher feedback
31–39	Final assessment of Learning aims B and C	AA	• **Lead-in:** Introduce the assessment Tasks 2 and 3 (see Assessment Workbook), detailing the main assessment criteria, deadline and submission criteria. • **Individual assessment activity:** Using the Assessment Workbooks, learners should complete Tasks 2 and 3.	Computers with IDE and game engine installed Assessment Workbooks

#	Topic	Lesson type	Suggested activities	Resources
40	Feedback	IS	• **Lead-in:** Introduce the feedback session so learners are aware that they will be reviewing each other's games. • **Individual activity:** Learners will be given a working game created by another learner and must provide critical feedback about the gameplay features and principles. • **Teacher-led discussion**: discuss the whole unit and gather feedback on how it was delivered and assessed. • **Individual activity**: Complete the feedback questionnaire and identify improvements that could be made to the unit.	Assessment Workbooks Learners' computer games Feedback questionnaire

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	1 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the unit content • understand the genres and social trends in computer gaming.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Presentation on genres and social trends in gaming • Access to computer games (online or console-based)
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (30 minutes)	• **Teacher-led discussion**: Introduction to unit and question learners about their gaming experience.
Main activity (130 minutes)	• **Teacher presentation**: Overview of genres and social trends in gaming. • **Individual activity:** Learners explore (play or research) multiple computer games to identify their genres and social trends.
Concluding activity (20 minutes)	• **Plenary**: Teacher confirms the main learning points identified in the lesson.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	2 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • be able to identify the visual styles of different computer games • understand the visual styles in computer gaming.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Presentation on visual styles in computer games • Computers with internet access
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (30 minutes)	• **Teacher presentation**: Give an overview of the different visual styles in computer gaming.
Main activity (140 minutes)	• **Individual activity**: Learners to research computer games and identify the visual styles of each game.
Concluding activity (10 minutes)	• **Plenary:** Teacher confirms the main learning points identified in the lesson and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	3 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the gameplay features and principles of computer gaming.

Resources checklist	• Dry wipe board or flip chart to collate feedback • Computers with internet access
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson using oral questioning and introduce aims and objectives for this lesson.
Main activity (150 minutes)	• **Teacher discussion:** Discuss the different gameplay features and principles, using examples of modern games. • **Paired/small-group activity:** Learners should research and document the different gameplay features and principles in modern gaming. Then pairs or small groups feed back to the whole class.
Concluding activity (10 minutes)	• **Plenary:** Teacher confirms the main learning points identified in the lesson and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	4 (3 hours)

Lesson objectives	At the end of the lesson, learners will be able to: • carry out the work required for the final assessment for Learning aim A.

Resources checklist	• Assessment Workbook • Computers with internet access
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (10 minutes)	• **Teacher presentation:** Introduce the assessment Task 1 (see Assessment Workbook) detailing the main assessment criteria, deadline and submission criteria.
Main activity (170 minutes)	• **Individual assessment activity**: Learners complete Task 1, using the Assessment Workbook.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	5–6 (6 hours)

Lesson objectives	At the end of the lesson, learners will: • be able to apply visual style within the design process • understand the visual style design process.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Visual style design process • **AS** Learner activity material – scenarios for which learners must design visual styles for games • Learner work from previous lessons • Computers with internet access
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson using oral questioning and introduce aims and objectives for this lesson.
Main activity (4 hours 30 minutes)	• **Teacher presentation/discussion**: Discuss the visual style design process using suitable examples. • **Individual activity**: Learners design solutions against given scenarios making use of visual styles.
Concluding activity (10 minutes)	• **Plenary:** Discuss how learners coped with the activity and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	7–8 (6 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the gameplay principles used in the design process.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Gameplay principles • **AS** Learner activity material – scenarios that learners must use to design gameplay principles • Learner work from previous lessons • Examples of computer games • Computers with internet access
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson using oral questioning and introduce aims and objectives for this lesson.
Main activity (5 hours 30 minutes)	• **Teacher presentation/discussion**: Discuss the gameplay principles used in the design process using suitable examples. • **Individual activity**: Learners design solutions against given scenarios making use of gameplay design principles.
Concluding activity (10 minutes)	• **Plenary:** Teacher confirms the main learning points identified in the lesson use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	9 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • identify what design documentation is needed for computer games development • be able to carry out standard design activities.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Presentation on design documentation • **AS** Learner activity material – design scenario • Computers with internet access
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson using oral questioning and introduce aims and objectives for this lesson.
Main activity (150 minutes)	• **Teacher presentation/discussion**: Discuss what design documentation is required for computer games development. • **Individual activity**: Give learners different scenarios so they can apply standard design documentation to them.
Concluding activity (10 minutes)	• **Plenary:** Teacher confirms the main learning points identified in the lesson and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	10–11 (6 hours)

Lesson objectives	At the end of the lesson, learners will be able to: • apply game play principles as part of the design process.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Application of gameplay principles in the design process • **AS** Gaming design scenario • Small dry wipe boards for paired activity/basic stationary for notetaking • Computers with internet access
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	Teaching notes
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson using oral questioning and introduce aims and objectives for this lesson.
Main activity (5 hours 30 minutes)	• **Teacher presentation/discussion**: Discuss the application of gameplay principles in the design process. • **Individual activity**: Learners design solutions against given scenarios, making use of gameplay principles such as: o interaction model o number of players o storyline and plot o goals o challenges o rewards o player actions o rules o difficulty o game mechanics (inventory, scoring, win condition o game feedback o game structure o addictiveness.
Concluding activity (10 minutes)	• **Plenary:** Discuss how learners coped with the activity and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	12–13 (6 hours)

Lesson objectives	At the end of the lesson, learners will be able to: • apply event-driven programming constructs in development of a computer game.

Resources checklist	• Dry wipe board or flip chart to collate feedback • Computers with IDE installed
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	Teaching notes
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson and introduce aims and objectives for this lesson.
Main activity (5 hours 30 minutes)	• **Teacher-led discussion:** Discuss using examples the event-driven constructs needed for game development. This should include: o common event handlers o custom event handlers o adding event handlers o raising event handlers o removing event handlers. • **Individual activity**: Learners create a simple game using event-driven functionality. • **Small group activity:** Learners should discuss their games. They should be prepared to explain/justify their choices. Learners can provide peer feedback.
Concluding activity (10 minutes)	• **Plenary:** Discuss how learners coped with the activity and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	14–15 (6 hours)

Lesson objectives	At the end of the lesson, learners will be able to: • apply object-oriented programming constructs in development of a computer game.

Resources checklist	• Dry wipe board or flip chart to collate feedback • Computers with IDE installed
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	Teaching notes
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson using oral questioning and introduce aims and objectives for this lesson.
Main activity (5 hours 30 minutes)	• **Teacher presentation/discussion**: Give an overview using examples of programming constructs used in object-oriented programming for computer game development, for example: o abstraction o classes o properties and methods (plus overloading and overriding via polymorphism) o objects (instantiation). • **Individual activity**: Learners create a simple game using object-oriented functionality. • **Small group activity:** Learners should discuss their games. They should be prepared to explain/justify their choices. Learners can provide peer feedback.
Concluding activity (10 minutes)	• **Plenary:** Discuss how learners coped with the activity and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	16–19 (12 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the need for game engines • be able to apply game engine features to create a computer game.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Gaming engines • Computers with internet access/game engine installed
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	Teaching notes
Introduction (10 minutes)	• **Teacher presentation:** Recap previous lesson and introduce aims and objectives for this lesson.
Main activity (11 hours 40 minutes)	• **Teacher presentation/discussion**: Give an overview of game engines using examples. • **Teacher demonstration**: Introduce learners to a gaming engine, focusing on: o graphic rendering o animation systems o artificial intelligence o level design o assets. • **Individual activity**: Learners use a game engine to create simple games. • **Small group activity:** Learners should discuss their games. They should be prepared to explain/justify their choices. Learners can provide peer feedback.
Concluding activity (10 minutes)	• **Plenary:** Discuss how learners coped with the activity and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	20 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the key features of computer game testing.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Testing for computer games • Computers with IDE and game engine installed
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson and introduce aims and objectives for this lesson. Question learners on their knowledge of testing computer games.
Main activity (150 minutes)	• **Teacher presentation**: Explain what testing involves for computer games. • **Individual activity**: Learners develop and test solutions for different scenarios.
Concluding activity (10 minutes)	• **Plenary:** Teacher confirms the main learning points identified in the lesson and use oral questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	21–23 (9 hours)

Lesson objectives	At the end of the lesson, learners will be able to: • apply games development tools to successfully create a computer game.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **AS** computer game scenarios • Computers with IDE and game engine installed
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson using oral questioning and introduce aims and objectives for this lesson.
Main activity (8 hours 40 minutes)	• **Teacher-led discussion:** Explain that learners will be given a problem that requires a computer game to be developed. Learners will plan, create and test the game. • **Individual activity:** Learners create a detailed solution for the game. • **Teacher feedback**: Provide ongoing feedback to learners for their developed games. • **Small group activity:** Learners should discuss their ideas/plans. They should be prepared to explain/justify their choices. Learners can provide peer feedback.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	24–29 (18 hours)

Lesson objectives	At the end of the lesson, learners will be able to: • identify what is required to complete an assessment.

Resources checklist	• Practice assessment task • Computers with IDE and game engine installed • Test plan template
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher presentation:** Recap previous lesson and introduce aims and objectives for this lesson.
Main activity (17 hours 40 minutes)	• **Individual activity**: Learners complete a practice assessment task like the final assessment.
Assessment: completed outside of class time	• **Teacher:** Collect learners' work from lessons 24–29. Identify areas of strength and areas that need to be improved in the written feedback**.**

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	30 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the requirements of the assessment.

Resources checklist	• Dry wipe board or flip chart to collate feedback • Marked learner work from lessons 24–29, with teacher feedback
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher presentation:** Introduce aims and objectives for this lesson.
Main activity (150 minutes)	• **Individual activity**: Learners should read through the marked work and identify areas that need to be improved and complete individual study on these areas.
Concluding activity (10 minutes)	• **Plenary:** Teacher confirms the main learning points identified in the lesson and use questioning to confirm learners' understanding.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	31–39 (30 hours)

Lesson objectives	At the end of the lesson, learners will be able to: • carry out the work required for the final assessment.

Resources checklist	• Assessment Workbook • Computers with IDE and game engine installed
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (10 minutes)	• **Teacher presentation:** Recap previous lesson and introduce aims and objectives for this lesson.
Main activity (29 hours 50 minutes)	• **Individual activity**: Learners complete Tasks 2 and 3, using the Assessment Workbook.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 8: Computer Games Development
Lesson number	40 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • know how well they did in the assessment • express their views on the unit.

Resources checklist	• Dry wipe board or flip chart to collate feedback • Computer games that learners have created • Feedback questionnaire
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (60 minutes)	• **Individual activity**: Learners will be given a working game created by another learner and must provide critical feedback about the gameplay features and principles.
Main activities (60 minutes)	• **Individual activity**: Learners will be given a working game created by another learner and must provide critical feedback about the gameplay features and principles. • **Teacher-led discussion**: discuss the whole unit and gather feedback on how it was delivered and assessed. • **Individual activity**: Complete the feedback questionnaire and identify improvements that could be made to the unit.

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