Pearson BTEC

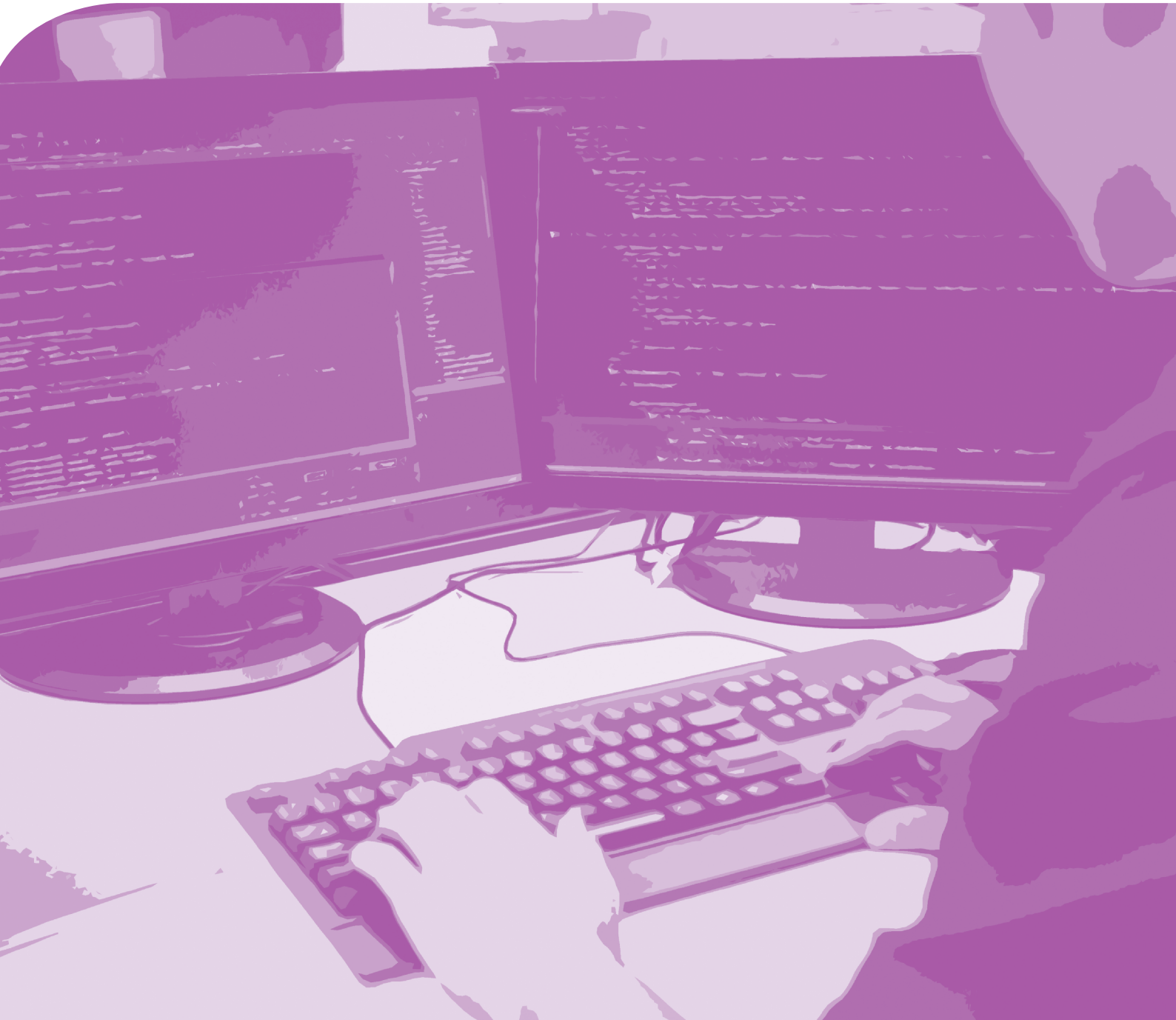
Pearson BTEC Uzbekistan Level 4 Qualifications in

Software Development

Unit 7: Mobile Apps Development

Teacher Resources

Issue 1



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ISBN 978 0 9978 8306 0

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 7: Mobile Apps Development

Delivery guidance

Approaching the unit

In this unit, your learners will investigate mobile apps and the devices that they run on. They will then go on to design and develop their own apps to run on mobile devices. As the mobile technology industry is booming and mobile apps are becoming increasingly important to many organisations, you should be able to identify plenty of real-life examples and relevant demonstrations to support your teaching. Learners must have access to adequate mobile app development environments and mobile devices (such as those stated in the unit specification) in order to complete the assessment for this unit. Preferably, learners will have access to a selection of devices and environments as this will give them more opportunities for comparison with development options.

Delivering the learning aims

Begin Learning aim A by discussing how learners use their mobile phones. It is likely that most, if not all, of your learners will have smartphones. Learners could discuss the kinds of app that they use and the different contexts in which they use them. This could lead on to a more general discussion about who uses apps and when and where they use them. Ask learners to consider why designers should ask themselves these questions.

Learners will need to have a good understanding of the different types of mobile app that are available (e.g. native, web and hybrid) and how they are implemented and used. When you are introducing the types of app and the contexts of their use, you could include the use of device functions within apps and then move on to talk in greater depth about the way in which apps are integrated with a mobile device and what this means for designers.

Introduce your learners to programming and programming environments for mobile development as early as possible. Allow regular periods of time for them to work with development tools. This will ensure that they understand the options available to them and have opportunities to practise their skills before starting work on Learning aims B and C. Throughout Learning aims B and C, guide learners through the process of choosing appropriate methods that they could use in their designs. Learners should also be familiar with the different techniques used in app design and be confident in the application of those that they will use in their own designs.

When designing their mobile apps, learners must be aware that, as with any software design, they should understand the scope of the design, and why the scope should be appropriate for the situation (and not be open-ended).

As far as possible, learners should consider their project in terms of the stages of software development, including analysis, design, development and testing. Give your learners as much time as possible to gain the practical skills that they will need to use in their own work and teach them how to use the chosen environment. You should also make sure that they are able to make use of all the techniques listed in the unit specification.

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 7: Mobile Apps Development
Introduction Mobile devices are prevalent in our society, with many people possessing several, and the mobile technology industry is still growing. Nowadays, many software developments must be compatible with mobile devices. Almost all public-facing companies and organisations have an app for their customers. As mobile app developers, your learners will need to analyse the device functionality required by apps and the capabilities of mobile devices. This will give them an understanding of the potential and the limitations of different mobile solutions.
Learning aim A – Investigate mobile apps and mobile devices
• As learners need to have knowledge of several implementation options. Give them examples of mobile devices of different types (e.g. phones and tablets, different operating systems or different makes and models of device). Demonstrate some examples of mobile device functions, such as accelerometers and global positioning systems (GPS). Discuss how different apps might use these functions in different ways and the implications that these functions have for the design and development of mobile apps. It would be beneficial for learners to have access to devices with the functions that you demonstrate and discuss, so that they can investigate the uses of each function.
Learning aim B – Design a mobile app to meet client requirements
• In groups, learners could build on earlier discussions to consider the types of app that they would like to design. Group discussions will help to generate ideas and give learners useful insights, even if they will ultimately work individually on their projects. Learners must be familiar with software development and the types of design documentation that they will need to produce and should understand the importance of documenting any design and development activity. Give learners real or fictional examples of the design process and documentation and talk through the different stages of the process and the different features of the documentation. • Learners will need to design the purpose, interface and algorithms for their app. To this end, they should be confident in the use of diagramming techniques and pseudocode. To build their confidence, learners investigate an app that is widely available and produce design diagrams and pseudocode to describe the app. Learners present their designs to their peers for review, refining their designs as necessary in response to constructive feedback. This activity could be done a number of times throughout the design process.

Unit 7: Mobile Apps Development
Learning aim C – Develop a mobile app to meet client requirements
• Give learners a sample of design documentation and demonstrate some of the steps in developing software from the schematic. Ask learners to present prototypes of their apps to a small audience, perhaps as a small-group task. They should use appropriate tools and techniques for their app, such as programming constructs, event handling and device capabilities. Make sure that learners also have plenty of time to review their own apps and those of their peers. This should be done late enough in the development for learners to have a functional app, but early enough for them to have time to make refinements based on the feedback they receive. • Programming constructs will build on learners' knowledge from Unit 4 and can be given more advanced activities depending on their abilities. • Learners test their mobile app for functionality, compatibility, usability, performance and acceptance. Their testing should go beyond their own testing activities or using learners in their group to test their apps. They should perform these tests using a variety of methods, such as white-box testing and black-box testing. They should rectify any issues that arise from these tests. • As the development process continues, learners should demonstrate their app to a larger audience and gather feedback from sample users to identify improvements and the overall level of acceptance. This forms the basis for their evaluation of their app with regards to requirements and user feedback.

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

http://developer.android.com/index.html

Android development portal

https://developer.apple.com

Apple iOS development portal

https://dev.windows.com/en-us

Microsoft Windows development portal

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 7: Mobile Apps 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 – Characteristics of good mobile apps	IS	• **Teacher presentation:** Give an overview of the characteristics of good mobile apps. • **Paired activity:** Learners explore multiple mobile apps to identify their characteristics and create presentation to present to whole class. • **Plenary**: Summarise the lesson and use oral questioning to confirm learners' understanding.	• Dry wipe board or flip chart to collate feedback • Teacher presentation and notes • Access to mobile apps
2	A2 – Types of mobile apps A3 – Uses of mobile apps A4 – Screen types for mobile apps	IS	• **Teacher-led discussion:** Introduce the different types of mobile apps. • **Teacher presentation:** Give an overview of the different uses of mobile apps. • **Individual activity 1:** Learners research mobile apps against different categories. • **Individual activity 2:** Learners investigate the different screen types available for mobile apps. • **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 • Teacher presentation on types and uses of mobile apps

#	Topic	Lesson type	Suggested activities	Resources
3	A5 – Mobile platforms	IS	• **Teacher-led discussion:** Discuss the different mobile app platforms. • **Paired/small-group activity 1:** Learners research and document the different mobile platforms, and what special hardware that each one uses • **Paired/small-group activity 2**: Investigate and feedback to group the factors that affect choice of mobile platform. • **Plenary:** Summarise the lesson and use oral questioning to confirm learners' understanding.	• Dry wipe board or flip chart to collate feedback • Computer with internet access
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 Workbook, learners should complete Task 1.	• Computers with internet access • Assessment Workbook

#	Topic	Lesson type	Suggested activities	Resources
5	B1 – Design documentation for a mobile app	IS	• **Teacher presentation/discussion:** Give an overview of the design documentation required for mobile app development. • **Paired/small-group activity:** Learners undertake a simple practical task to produce standard design documentation based on a scenario. Learners to review designs with other groups • **Plenary:** Summarise the lesson and use oral questioning to confirm learners' understanding.	• Learner activity material • Teacher presentation and notes • Computers with internet access • Dry wipe board or flip chart to collate feedback
6–7	B1 – Design documentation for a mobile app – user experience (UX) design	IS	• **Teacher-led discussion/presentation:** Understanding the UX design process. • **Individual activity:** Use information architecture, wireframing and a prototype to create a UX design for a given scenario. • **Plenary:** Discuss how learners coped with the activity and oral questioning to identify any gaps in understanding.	• Flip chart or similar for learners to record discussions and ideas • Teacher presentation and notes • Learner work from previous lesson • Scenarios • Computers with internet access

#	Topic	Lesson type	Suggested activities	Resources
8–9	B1 – Design documentation for a mobile app – User Interface (UI) design	IS	• **Teacher-led discussion/presentation:** Understanding UI design process. • **Individual activity:** Use style guides, rendered design and rendered click-through design to create a UI 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 • Teacher presentation and notes • Scenarios • Computers with internet access
10–11	B1 – Design documentation for a mobile app – Programming design	IS	• **Teacher-led discussion/presentation:** Understanding programming design process. • **Individual activity:** Use pre-defined code, flow charts, pseudocode, control structures and data validation to create a programming design for a given scenario. • **Individual activity:** Create assets to be used in the design process. • **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 • Teacher presentation and notes • Learner work from previous lesson • Scenarios • Computers with internet access

#	Topic	Lesson type	Suggested activities	Resources
12	C1 – Programming constructs	IS	• **Teacher presentation/discussion:** Presentation and discussion on the different technologies used to support programming and mobile platform development. • **Individual activity:** Learners use the different technologies to create simple apps.	• Teacher presentation and notes • Computers with IDE installed
13–14	C1 – Programming constructs – event driven	IS	• **Teacher-led discussion**: Description and examples of event-driven programming characteristics. • **Individual activity:** Learners create a simple app using event driven functionality. Learners should present their app to the whole class. They should be prepared to explain/justify their choices.	• Computers with IDE installed
15–16	C1 – Programming constructs – object-oriented	IS	• **Teacher-led discussion**: Description and examples of object-oriented programming characteristics • **Individual activity**: Learners create a simple app using object-oriented functionality. Learners should present their app to whole class. They should be prepared to explain/justify their choices.	• Computers with IDE installed
17	C1 – Programming constructs – utilising device capabilities and orientation of device	AA	• **Teacher presentation:** Discuss different device capabilities and how these can be developed, along with orientation of devices. • **Individual activity:** Learners add device capabilities and orientation to one of their existing apps created in previous lessons.	• Computers with IDE installed • Teacher presentation

#	Topic	Lesson type	Suggested activities	Resources
18	C2 – Testing a mobile app	IS	• **Teacher presentation:** Explain what testing involves for mobile apps. • **Individual activity**: Give learners a number of different scenarios. They have to develop and test a solution for each scenario.	• Teacher presentation and notes • Computers with IDE installed • Scenarios for use of develop and testing
19–21	C – App development practice	IS	• **Lead-in:** Explain to learners that over the next 3 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 will plan, create and test the app. Learners should discuss their ideas/plans. They should be prepared to explain/justify their choices.	• Computers with IDE installed • Small dry wipe boards for paired activity/basic stationary for making notes • Scenarios

#	Topic	Lesson type	Suggested activities	Resources
22–27	Learning aims B and C Practice assessment	IS/AA	• **Lead-in:** Explain to learners that over the next 6 lessons they will complete a practice assessment to prepare them for their final assessment. • **Individual assessment activity:** Learners respond to a practice assessment brief 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 no**t be the same one that will be used to assess their final grade for the unit.*	• Computers with IDE installed • Practice assessment • Test plan template
28	Practice assessment feedback	IS/AA	• **Lead-in:** Provide learners with the marked work and feedback on the practice assessment (lessons 22–27). • **Individual activity:** Learners read through the marked work and identify areas that need to be improved. Learners complete individual study on areas where they need improvement	• Computers with IDE installed • Learner work lessons 22–27 • Teacher feedback
29–39	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 Workbook, learners complete Tasks 2 and 3.	• Computers with IDE installed • Assessment Workbook

#	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 mobile app created by another learner and must provide critical feedback. • **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' mobile apps developed for the assessment • Feedback questionnaire

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 7: Mobile Apps Development
Lesson number	1 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the unit content • understand the characteristics of good mobile apps.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Presentation on characteristics of mobile apps • Mobile apps
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction to unit (30 minutes)	• **Teacher-led discussion**: Introduce the unit and ask learners about their experience of mobile app development.
Main activity (130 minutes)	• **Teacher presentation**: Overview of characteristics of good mobile apps. • **Paired activity:** Learners explore multiple mobile apps to identify their characteristics and create presentation to present to whole class.
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 7: Mobile Apps Development
Lesson number	2 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • be able to identify the different types of mobile apps • understand the different categories of mobile apps • understand the need for different screen types in mobile apps.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Presentation on types and uses of mobile apps • Computers with internet access • Native apps, web apps, and hybrid apps: nngroup.com/articles/mobile-native-apps/
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (30 minutes)	• **Teacher-led discussion:** Introduce the different types of mobile apps. • **Teacher presentation:** Give an overview of the different uses of mobile apps. Question learners to see what they use mobile apps for.
Main activity (140 minutes)	• **Individual activity 1**: Learners to research mobile apps against the various categories. • **Individual activity 2**: Learners to investigate the different screen types available for mobile apps.
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 7: Mobile Apps Development
Lesson number	3 (3 hours)

Lesson objectives	• At the end of the lesson, learners will: • understand the differences between mobile platforms.

Resources checklist	• Dry wipe board or flip chart to collate feedback • Computers with internet access • Getting started with MIT App Inventor 2: appinventor.mit.edu/explore/get-started? • Android Studio (a free integrated development environment for Android): developer.android.com/tools/sdk/eclipse-adt.html • Free online IDE and terminal (many languages): tutorialspoint.com/codingground.htm
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher:** Recap previous lesson with oral questioning to confirm understanding and introduce aims and objectives for this lesson.
Main activity (150 minutes)	• **Teacher-led discussion:** Discuss the different mobile app platforms. • **Paired/small-group activity 1:** Learners research and document different the different mobile platforms, and what special hardware each one uses. • **Paired/small-group activity 2:** Learners investigate and feedback to the whole group the factors that affect choice of mobile platform.
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 7: Mobile Apps 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 of 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:** 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 in the Assessment Workbook.

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 7: Mobile Apps Development
Lesson number	5 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • know what design documentation is needed for mobile app 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:** Recap previous lesson with oral questioning to confirm understanding and introduce aims and objectives for this lesson
Main activity (150 minutes)	• **Teacher presentation/discussion**: Discuss what design documentation is required for mobile app development. • **Paired/small group activity**: Give learners different scenarios so they can apply standard design documentation to them. Pairs then review designs with others.
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 7: Mobile Apps Development
Lesson number	6 and 7 (6 hours)

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

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** UX design • Learner work from previous lesson • Computers with internet access • **AS** Learner activity material – scenarios learners must design • How to construct and manage a graphical, event-driven user interface for your iOS: developer.apple.com/library/ios/documentation/UIKit/Reference/UIKit_Framework/ • Suite of Android UI library, component and app templates: droidux.com/
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	Teaching notes
Introduction (20 minutes)	• **Teacher:** Recap previous lesson with oral questioning to confirm understanding and introduce aims and objectives for this lesson.
Main activity (5 hours 30 minutes)	• **Teacher presentation/discussion**: Discuss the UX design process, using suitable examples. • **Individual activity**: Learners design solutions against given scenarios, making use of UX design principles – information architecture, wireframing and a prototype.
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 7: Mobile Apps Development
Lesson number	8 and 9 (6 hours)

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

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** UI Design • **AS** Learner activity material – scenarios learners must design • Learner work from previous lesson • Computers with internet access • How to Construct and manage a graphical, event-driven user interface for your iOS: developer.apple.com/library/ios/documentation/UIKit/Reference/UIKit_Framework/ • Suite of Android UI library, component and app templates: droidux.com/iPhone Development that outlines sizes of iPhone for UI Elements: idev101.com/code/User_Interface/sizes.html • Android screen compatibility overview: developer.android.com/design/style/devices-displays.html • Create mobile prototypes in minutes: fluidui.com/ • Getting started with MIT App Inventor 2: appinventor.mit.edu/explore/get-started?
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	Teaching notes
Introduction (20 minutes)	• **Teacher:** Recap previous lesson with oral questioning to confirm understanding and introduce aims and objectives for this lesson
Main activity (5 hours 30 minutes)	• **Teacher presentation/discussion**: Discuss UI design process, using suitable examples. • **Individual activity**: Use style guides, rendered design and rendered click-through design to create a UI design for a given scenario.
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 7: Mobile Apps Development
Lesson number	10 and 11 (6 hours)

Lesson objectives	At the end of the lesson, learners will: • be able to design mobile apps using the programming design process and create assets to be used • understand the programming design process.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** programming design process and assets • **AS** programming design scenario. • Learner work from previous lesson • Computers with internet access • Small dry wipe boards for paired activity/basic stationary for note-taking
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher:** Recap previous lesson with oral questioning to confirm understanding and introduce aims and objectives for this lesson.
Main activity (5 hours 30 minutes)	• **Teacher presentation/discussion**: Discuss the programming design process and assets to be used. • **Individual activity**: Use pre-defined code, flow charts, pseudocode, control structures and data validation to create a programming design for a given scenario. • **Individual activity:** Create assets to be used in the design process.
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 7: Mobile Apps Development
Lesson number	12 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the different technologies used to support programming and mobile platform development.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Teacher presentation and notes • Introduction to objective C: Ctryobjectivec.codeschool.com/ • Android Event Handling: tutorialspoint.com/android/android_event_handling.htm • Getting started with MIT App Inventor 2: appinventor.mit.edu/explore/get-started? • Android Studio (a free integrated development environment for Android): developer.android.com/tools/sdk/eclipse-adt.html • Free online IDE and terminal (many languages): tutorialspoint.com/codingground.htm
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	Teaching notes
Introduction (20 minutes)	• **Teacher:** Recap previous lesson with oral questioning to confirm understanding and introduce aims and objectives for this lesson.
Main activity (150 minutes)	• **Teacher presentation/discussion**: Give an overview of the different technologies used to support programming and mobile platform development, which should include: o programming languages, e.g. Objective-C, Java. Microsoft C#, C, C++, Objective Pascal, Lua, Visual Basic, .net etc. o scripting languages, e.g. JavaScript etc. o style sheet languages, e.g. CSS3. o mark up languages e.g. HTML5. o SDK (Software Development Kit), e.g. Android SDK. o API (Application Programmers Interface), e.g. configuration, e.g. XML (eXtensible Markup Language). • **Individual activity**: Learners should use some of the different technologies to develop simple apps.
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 7: Mobile Apps Development
Lesson number	13–14 (6 hours)

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

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

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher:** 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 app development. This should include: o components of event handling o user events o time-based events. • **Individual activity**: Learners create a simple app using event-driven functionality. Learners will then demonstrate their app. They should be prepared to explain/justify their choices.
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 7: Mobile Apps Development
Lesson number	15–16 (6 hours)

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

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**: Recap previous lesson with oral questioning to confirm understanding 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 mobile app 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 app using object-oriented functionality. Learners will demonstrate their app. They should be prepared to explain/justify their choices.
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 7: Mobile Apps Development
Lesson number	17 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • understand the need for utilising device capabilities • be able to apply device capability features.

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

Activities	**Teaching notes**
Introduction (10 minutes)	• **Teacher:** Recap previous lesson and introduce aims and objectives for this lesson.
Main activity (160 minutes)	• **Teacher presentation/discussion**: Give an overview of how to utilise device capabilities. • **Individual activity**: Learners add device and orientation to existing apps created in lessons 13–16.
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 7: Mobile Apps Development
Lesson number	18 (3 hours)

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

Resources checklist	• Computers with IDE installed • Scenarios for use of develop and testing • **PS** Mobile app testing
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (10 minutes)	• **Teacher**: Recap previous lesson and introduce aims and objectives for this lesson.
Main activity (160 minutes)	• **Teacher presentation**: Explain what testing involves for mobile apps. • **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 7: Mobile Apps Development
Lesson number	19–21 (9 hours)

Lesson objectives	At the end of the lesson, learners will be able to: • apply mobile app development tools to successfully create an app.

Resources checklist	• Dry wipe board or flip chart to collate feedback • **PS** Teacher presentation and notes • **AS** Mobile app scenarios
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher:** Recap previous lesson with oral questioning to confirm understanding and introduce aims and objectives for this lesson.
Main activity (8 hours 30 minutes)	• **Teacher presentation**: Explain the different scenarios that must be developed by learners. Get learners to consider the design principles of each scenario before starting development. • **Individual activity**: Learners plan, create and test the solutions for the scenarios. Learners should discuss their solutions. They should be prepared to explain/justify their choices.
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 7: Mobile Apps Development
Lesson number	22–27 (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	• Computers with IDE installed • Practice assignment • Test plan template
Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide	

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

Lesson plan

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 7: Mobile Apps Development
Lesson number	28 (3 hours)

Lesson objectives	At the end of the lesson, learners will: • be prepared to take the assessment for Learning aims B and C.

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

Activities	**Teaching notes**
Introduction (20 minutes)	• **Teacher discussion:** Discuss a marked piece of work so learners understand how well it met the requirements of the task. Use oral questioning to confirm understanding.
Main activity (150 minutes)	• **Individual activity**: Learners should read through their own 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 7: Mobile Apps Development
Lesson number	29–39 (33 hours)

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

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

Activities	**Teaching notes**
Introduction (10 minutes)	• **Teacher:** Recap previous lesson and introduce Assessment Workbook to learners.
Main activity (32 hours 50 minutes)	• **Individual assessment 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 7: Mobile Apps 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 • Mobile apps that leaners have developed • 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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Registered Office: 80 Strand, London WC2R 0RL.

VAT Reg No GB 278 537121

ISBN 978-0-9978830-6-0