

# Unit 13: Mobile Communication Technologies

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| Unit code:             | H/601/3398      |
| QCF Level 2:           | BTEC Specialist |
| Credit value:          | 10              |
| Guided learning hours: | 60              |

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## Aim and purpose

The aim of this unit is to give learners a knowledge of the uses and features of mobile communications devices. Learners will gain an understanding of the implications of mobile communication technologies.

## Unit introduction

Surveys show that upwards of 80 per cent of adults living in the UK currently own a mobile telephone. However, the full range of mobile communications technology embraces more than just the telephone. With the introduction of new operating systems and the increasing prevalence of broadband connectivity, wireless technologies have become a commercially-successful mainstay in the IT industry. An increasing number of Personal Data Assistants (PDAs), smart phones and notebook personal computers (PCs) come equipped with wireless connectivity as standard. Households often have more than one computer and wireless networking enables the remote sharing of printers, file exchange and fast internet connection. This same technology has also liberated private and commercial networks from traditionally structured cabled solutions and provided internet access in public places such as railway stations, cafes and parks (via so called 'hotspots'). It has also revolutionised the Small Office/Home Office (SoHo) environment by offering greater freedom and flexibility to the way that people live, work and talk to each other.

Mobile communications is not without its problems and challenges; most notably the malicious attempts by hackers to intercept and interfere with network data.

This unit shows learners the different (and often competing) wireless technologies which are currently available, the mobile devices which benefit them and how these can be used to offer solutions that would have previously been impossible or unthinkable. Additionally, learners will be shown how to create and configure simple wireless communication networks, securing them with current tools and available protocols. Consideration of the technology's impact on the individual and on society as a whole will also be encouraged.

## Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

### On completion of this unit a learner should:

| Learning outcomes   | Assessment criteria  |
|---|--|
| 1 Know the uses and features of mobile communication devices      | 1.1 identify different types of mobile communication device<br>1.2 describe the features of different types of mobile communication devices                        |
| 2 Know the communication technologies used in mobile devices      | 2.1 identify the protocols used by mobile communication devices, giving examples of their use<br>2.2 describe the technology used by a mobile communication device |
| 3 Understand the implications of mobile communications technology | 3.1 explain the benefits of mobile working in organisations<br>3.2 explain the social and legal implications of using mobile technologies                          |
| 4 Be able to set up mobile communication devices                  | 4.1 set up and configure a mobile communications device to meet a defined requirement  |

## Unit content

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### 1 Know the uses and features of mobile communication devices

*Devices:* types eg mobile phones, digital cordless phones, PDAs, laptops, palmtops; other eg radio frequency identification devices (RFID)

*Uses:* business eg email, word processing, conferencing, calendar; specialist eg graphic design, bespoke software, monetary transactions, service management; personal eg online gaming, messaging, web browsing;

*Features:* eg video link, texting, internet access, email, picture messaging, GPS tracking, geocaching, synchronisation, cloud storage;

### 2 Know the communication technologies used in mobile devices

*Transmission technology:* types eg infrared, Bluetooth, Wireless Fidelity (WiFi), GSM, GPRS, 2.5G, 3G; data transfer rates; effective ranges

*Standards and protocols:* types eg 802.11 for WiFi, IrDA for Infrared; wireless access protocols; SMS protocols

*Wireless networking:* wireless access points eg hotspots; wireless network adaptors; Protection: methods eg wireless encryption methods (WEP, WPA, AES, EAP); interference from other devices

### 3 Understand the implications of mobile communications technology

*Benefits:* efficiency eg group communication, information sharing, paperless working

*Social implications:* human interaction eg text messaging, multimedia messaging, emails, virtual offices; health issues eg posture, RSI, eye strain; environmental effects eg visual impact of phone masts, disposal of components; illegal imagery

*Legal implications:* data security eg accidental loss, theft; hacking activities eg wardriving, piggybacking, packet sniffing;

*Disadvantages:* effective range of equipment; interference; perceived health hazards eg radiation

### 4 Be able to set up mobile communications devices

*Devices:* types eg mobile phones, digital cordless phones, PDAs, laptops, palmtops; other eg radio frequency identification devices (RFID)

*Set up:* select devices; connect devices; configuration eg date and time, address books; test data transfer

*Requirements:* functions eg email, SMS, connection types

*Mobile working:* service management eg repairs, sales, package delivery

*Evaluation:* check eg meets requirements, stress testing, general usability

## Essential guidance for tutors

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### Delivery

There is an even balance between theory and practical content in this unit and keeping learners engaged will be easier if the practical activities are embedded into the theoretical content.

Some of the early content may be quite complicated for learners who have not done any networking units before and tutors may want to use the mobile devices that learners own as a continuing frame of reference. When the learner is engaging with the standards and protocols that may otherwise seem a distant and unfamiliar concept, the tutor can refer them to the functionality on their own handsets.

Practical issues within institutions, eg policies on the use of mobile telephones, may have a significant effect on the delivery of this unit. It is very likely, however, that this unit will be attractive to learners and provide many opportunities to link their own personal use of mobile devices with formal studies. With these influences in mind, clear setting of working guidelines to learners about the use of their own devices will be necessary. Significant opportunities exist within the delivery of this unit to cover many of the practical issues around the use of mobile devices, particularly mobile phones. On completion, learners should be much more aware of such aspects as costs, perceived health hazards and other pitfalls of using phones and these could be of great value to them.

It would be beneficial for learners to have access to mobile technologies such as smart phones, PDAs, netbooks or mobile broadband modems (dongles). Centres may wish to procure or borrow these items but must ensure that the learner is able to experience all aspects of their functionality such as Bluetooth connectivity and access to a PC software suite designed for use with a particular device.

For those tasks which involve examining mobile working, it would be useful for learners to meet a guest speaker who has experience using mobile technology in a business setting. A suitable guest could be a manager of the local branch of a delivery business that tracks its vehicles using mobile devices, or an IT consultant familiar with mobile technology.

A formally structured and delivered programme is recommended. Consideration should be given before the start of this unit as to whether learners may bring and use their own personal devices as this could be disruptive.

## Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments. The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

| Topic and suggested assignments/activities and/assessment   |
|---|
| Introduction to the unit  |
| <p><b>Characteristics of mobile devices:</b></p> <ul style="list-style-type: none"> <li>• whole-class exercise – learners will experiment with different devices</li> <li>• whole-class exercise – tutor presentation on uses of mobile communication devices, followed by whole-class</li> <li>• practical</li> <li>• whole-class exercise – tutor-led discussion of the different services available.</li> </ul>  |
| <p><b>Communication technologies used in mobile devices:</b></p> <ul style="list-style-type: none"> <li>• whole-class exercise – tutor-led discussion regarding transmission technology</li> <li>• directed research – what standards and protocols are available</li> <li>• whole-class exercise – tutor presentations on licensing issues</li> <li>• whole-class exercise – understanding the different wireless network access points.</li> </ul>  |
| Assignment 1 - Mobile Technology  |
| <p><b>Implications of mobile communications:</b></p> <ul style="list-style-type: none"> <li>• whole-class exercise – discussion of how mobile device change the way you do things</li> <li>• directed research – legal implications of mobile communication technology</li> <li>• directed research – social implications of mobile communication technology</li> <li>• whole-class exercise – tutor presentation on ways to protect a wireless network, followed by a class practical</li> <li>• whole-class exercise – tutor presentation on disadvantages of mobile communications devices.</li> </ul> |
| Assignment 2 - Benefits and Drawbacks   |
| <p>Taking advantage of mobile communications:</p> <ul style="list-style-type: none"> <li>• whole-class exercise – tutor-led discussion of how firms use mobile technology</li> <li>• individual exercise – learn how to set up a wireless network</li> <li>• individual exercise – learn how to check a wireless network is working properly.</li> </ul>  |
| Assignment 3 - Mobile Devices   |

## Assessment

It is suggested that this unit is assessed using three assignments as summarised in the *Programme of suggested assignments* table.

Evidence for this unit can be gathered from learners undertaking project work based around real-world case studies. It would be realistic for learners to present one integrated assignment but evidence can be built up from a number of tasks including practical exercises. Learners may use their own mobile devices for practical activities and subject matter.

To achieve a pass grade, learners must achieve the six pass criteria listed in the assessment and grading criteria grid.

For 1.1 at this level, tutors should direct learners to identify different kinds of mobile communication device. This criterion should be completed with reference to the first part of the content for learning outcome 1. A variety of strategies could be used to provide evidence including visual or online presentation, leaflet, poster or report.

For 1.2 learners should describe the features of different types of mobile communication device. 1.2 follows on naturally from 1.1 and will probably address the same devices. Evidence may include a visual or online presentation, leaflet, poster or report.

For 2.1, learners should describe the standards and protocols used by a mobile communication device, A variety of strategies could be used to provide evidence including visual or online presentation, leaflet, poster or report.

For 2.2, learners should describe the technology used by a mobile communication device, and as with 2.1, should reference the appropriate part of the 'Standards and Protocols' section of the content for learning outcome 2. Evidence may include a visual or online presentation, leaflet, poster or report.

For 3.1, learners should be able to describe at least two benefits of using mobile technology to help an organisation work more efficiently. Learners will need to describe which technologies will benefit organisations, but also to state why, and to give examples, such as the management of a large mobile workforce at a utility firm or a delivery company. Evidence for this criterion could come from a report written for a hypothetical firm that is actively looking at mobile technology to help it become more efficient.

For 3.2, learners are expected to identify the social and legal implications of using wireless technologies. Learners could produce a table listing these in a column. The deeper impact they have on society might not be considered. A variety of strategies could be used to provide evidence including visual or online presentation, leaflet, poster or report.

For 4.1, learners should set up a mobile communications device to meet a defined need. The defined need can be chosen by either learners in consultation with the tutor, or be set out by the tutor. Either way, learners must show that they can achieve the criterion. Evidence for this practical activity is expected to be a written report by learners identifying how they met the defined needs with witness statements. Evidence of how learners have tested the device could be shown with a demonstration, recorded with an observation record.

**Programme of suggested assignments**

The table below shows a programme of suggested assignments that cover the assessment criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

| Criteria covered   | Assignment title       | Scenario  | Assessment method  |
|--------------------|------------------------|---|--------------------|
| 1.1, 1.2, 2.1, 2.2 | Mobile Technology      | A business has asked you to help it understand mobile technology better, by writing a short guide to a mobile device and a real world applications. | Leaflet or poster. |
| 3.1, 3.2           | Benefits and Drawbacks | The business would now like you to give a short presentation on the benefits, and the social and legal implications, of mobile technology.          | Presentation.      |
| 4.1                | Mobile Devices         | The business has selected a mobile device it thinks would be useful. It wants you to set it up for use, and check it is right for them.             | Written report.    |

### Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC in IT sector suite. This unit has particular links with:

| Level 1 | Level 2                                       | Level 3                    |
|---------|---|----------------------------|
|         | Telecommunications Technology                 | Communication Technologies |
|         | An Introduction to Communication Technologies | Telecommunication Systems  |

This unit maps to some of the underpinning knowledge from the following areas of competence in the Level 2 National Occupational Standards for IT (ProCom):

#### 4.3 Human Needs Analysis.

#### Essential resources

For this unit learners will need good background materials in the form of handouts and diagrams of wireless networks and mobile devices. These can be placed into context by the use of case studies or local examples.

Learners need also to be advised where to look for materials that can back up their work with research, for example links to resources on the internet, magazines or library. A suitable course textbook may also prove effective in providing essential background reading. Access to a sample range of mobile devices and wireless technologies is also essential for practical exercises and assessment opportunities. Learners may be encouraged to use their own devices to complement centre resources.

#### Employer engagement and vocational contexts

The use of vocational context is essential in the delivery and assessment of this unit.

Learners will require access to computer equipment to enable them to gain a practical awareness and enable them to apply their knowledge and understanding in a practical situation.

There is a range of organisations that may be able help centres to engage and involve local employers in the delivery of this unit, for example:

- Learning and Skills Network – [www.vocationallearning.org.uk](http://www.vocationallearning.org.uk)
- Local, regional business links – [www.businesslink.gov.uk](http://www.businesslink.gov.uk)
- National Education and Business Partnership Network – [www.nebpn.org](http://www.nebpn.org)
- Network for Science, Technology, Engineering and Maths Network Ambassadors Scheme – [www.stemnet.org.uk](http://www.stemnet.org.uk)
- Work-based learning guidance – [www.aimhighersw.ac.uk/wbl.htm](http://www.aimhighersw.ac.uk/wbl.htm)
- Work experience/workplace learning frameworks – Centre for Education and Industry (CEI University of Warwick) – [www.warwick.ac.uk/wie/cei](http://www.warwick.ac.uk/wie/cei)

## Indicative reading for learners

### Textbooks

Briere D and Hurley P – *Wireless Home Networking for Dummies* (Hungry Minds Inc US, 2003) ISBN 0764539108

Davis H – *Absolute Beginner's Guide to Wi-Fi Wireless Networking* (Que, 2004)  
ISBN 0789731150

Hansmann U – *Pervasive Computing: The Mobile World* (Springer-Verlag Berlin and Heidelberg GmbH & Co K, 2003) ISBN 3540002189

Vos I and de Klein P – *The Essential Guide to Mobile Business* (Prentice Hall PTR, 2001)  
ISBN 013093819X

### Journals

*Mobile News*

*What Mobile*

### Website

[www.becta.org.uk/mobiletechnologies](http://www.becta.org.uk/mobiletechnologies)

**Functional Skills – Level 2**

| Skill   | When learners are ...   |
|---|---|
| <b>ICT - Using ICT</b>  |   |
| Select, interact with and use ICT systems safely and securely for a complex task in non-routine and unfamiliar contexts                   | using diagnostic tools to identify common faults<br>applying identified fault remedies and checking they work |
| <b>Mathematics - Representing</b>   |   |
| Identify the situation or problems and identify the mathematical methods needed to solve them   | setting up, configuring and testing a mobile communications device to meet a defined need                     |
| <b>English - Writing</b>  |   |
| Write a range of texts, including extended written documents, communicating information, ideas and opinions, effectively and persuasively | creating written reports for the assignment.  |