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GCSE ICT

Unit 1 – Technology Update
Issue 8
(Spring 2017)

This Technology Update (TU) clarifies what digital technology students are expected to learn about in Unit 1 - Living in a Digital World. It is updated annually to take account of emerging technologies. All updates relate directly to the content of the Unit 1 specification and this document should be used in conjunction with the specification.

An updated TU will be published in May each year on the Pearson website.

This issue will be valid for the June 2018 Unit 1 examination.

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Topic 1 Personal digital devices

Mobile phones	
• Smartphones	*Smartphones provide significantly greater functionality than basic phones and are better suited for activities such as email, social networking, surfing the web and running mobile applications.*
• Modular Smartphones	*A modular smartphone (e.g. Project Ara) contains different component features. Each component can be changed. This adaptability brings benefits including less waste, cheaper repairs and enhanced personalisation.*
• Specialist phones	*Specialist phones are designed for a very specific target market, e.g. elderly people, people who are partially sighted and those operating in challenging environments.*
Phone peripherals	
• Headsets (hands free) • Removable storage	

Personal computers	
• Desktops	*Desktops include 'All in one'.*
• Laptops	
• Tablets	*As tablets and smartphones develop they begin to share features.*
• Single-board computers	*Single-board computers (SBCs) are affordable, complete computers made for education and development e.g. Raspberry Pi.*
• Wearable computers	*E.g. Smartglasses such as Google Glass, Smartwatches, fitness bands etc.*
Computer peripherals	
• Screens • Keyboards • Pointing devices, e.g. mouse, stylus, touchpad, nipple • Microphones/speakers/headsets • Printers • Scanners • Graphic tablets • Webcams • Removable storage • Electronic whiteboards	*E.g. 3D printers.* *Removable storage includes all devices not built into the PC, e.g. USB flash drives, memory cards, and USB hard drives.*

Cameras and camcorders	
• Digital (stills) camera • Digital camcorders	*Students should know the difference between high definition (HD) and standard definition (SD).*
Camera peripherals	
• Removable storage	

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Games consoles	
• Hand-held consoles • Consoles	
Games peripherals	
• Game controllers • Removable storage • 3D – using glasses/parallax	*Parallax 3D is a barrier placed in front of an image to give a sense of depth. 3D is also used in TV.*

Home entertainment systems	
• Televisions (including Smart TVs and 3D TVs)	*Smart TVs have access to the internet and use apps. Newer televisions often have very high resolution screens. These screens are referred to as '4K', due to their (approximate) 4,000 pixel horizontal resolution.*
• Projectors	
• DVD players/recorders	
• Blu-ray players	
• Personal video recorders (PVR)	
• Set-top boxes (STB)	*Some devices may fall into multiple categories, e.g. a Sky+ box is both a STB and a PVR.*
• Media stations	*Media stations are devices that provide video/audio to a television, e.g. Apple TV. This could be by streaming from a remote source or from local storage.*
• Sound systems (HiFi)	
• Smart speakers	*Smart speakers combine wireless speakers with a microphone and intelligent personal assistant software that allows users to give voice commands.*

Personal media players	
• Personal audio players • Personal video players • E-book readers	
Personal media peripherals	
• Speakers/headsets	

Navigation aids	
• In-car sat navs • Specialist sat navs, e.g. for walkers and cyclists	*An in-car sat nav could be a separate unit or integrated into the dash.*

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Features of digital devices	
• Methods of charging (wireless/ USB etc)	*Wireless or 'inductive' charging allows short-distance wireless energy transfer between two devices.*
• Sensors	*Sensors (such as accelerometers) are often found in personal digital devices. Data from them is used by the device's software to enhance the user experience.*
• NFC (Near Field Communication)	*E.g. Contactless payment debit cards and smartphone NFC chips.*
• Convergence	*Digital devices often contain multiple features that allow the device to provide multiple functions. Those functions would have previously only been available in single-purpose devices. This multi-functionality increases convenience, however, each function could be of lower quality than could be found on a single-purpose device.*
• Intelligent personal assistant	*E.g. Apple Siri, Amazon Alexa, Microsoft Cortana.*

Topic 2 Connectivity

Digital communications – device to device	
Wired connections: • USB, USB 2.0, USB 3.0, USB Type-C • Firewire • Thunderbolt • Lightning • eSATA	*Firewire and Thunderbolt are high speed data ports.*
Wired multimedia connections: • Digital audio (e.g. SPDIF) • HDMI (High Definition Multimedia Interface) • Switches/splitters	*HDMI transfers uncompressed digital data. Typically, it is used for connecting high definition video and audio devices.* *A switch will allow multiple inputs to be output to one (or more) device(s). A splitter will allow one input to be output to multiple devices.*
Wireless connections: • Infrared • Bluetooth • WiFi (Wireless Ethernet), WiFi Direct	*WiFi Direct is a way of allowing two devices to easily communicate/ transfer data.*
Security protocols: • Wired Equivalent Privacy (WEP) • WiFi Protected Access (WPA) • WPA2	*Each security protocol provides for the encryption of data over wireless networks.*
Telecommunications: • Mobile phone networks (GSM, EDGE, 3G, HSPA, 4G) • Mobile phone bands (Dual, Tri, Quad) • Landline phone network • Fibre optic cable network	*Newer technologies (such as HSPA and 4G) greatly improve the speed at which mobile phone networks provide online access.*

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Equipment needed to create a home network	
• Modem • Router • Switch/hub/bridge • Wireless base station/adapter	*In many cases one device fulfils multiple functions.* *Types of modem include ADSL, cable and wireless broadband (3G).*
• Powerline networks	*A powerline network uses existing power wiring as a framework to carry data (e.g. HomePlug Power Alliance).*

Digital communications – broadcast	
• Radio (AM/FM/digital/internet)	*Users can access radio and TV in different ways. Each method has its advantages and disadvantages.*
• TV (analogue/digital/internet)	*Digital signals can be transmitted by cable, satellite or radio transmitter.*

Topic 3 Operating online

Data protection	
• IP filtering	*IP Filtering prevents data from entering a network. One use of IP filtering is to prevent access from certain locations.*
• Policies	*E.g. An Acceptable Use Policy sets out the expectations of users when accessing a website or service.*

Topic 4 Online goods and services

News and other information services	
• Viral videos	*A video could be said to have gone 'viral' when it has been shared online by many people.*
• RSS	*RSS is a method of subscribing to online content.*

Software as a service	
• Cloud computing	*Online data storage and hosted applications are often combined to provide a 'cloud computing' facility.*

Impact on organisations and individuals	
• QR codes (Quick Response)	*QR codes provide a way to link to online services using a camera and QR reader.* *This QR code links to Pearson Edexcel's GCSE ICT website.*
• Geo-tagging	*The addition of location data to files (e.g. images), usually set by built-in GPS. The data can be used for searching, filtering or for display purposes.*

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Banking and other financial services	
• Chip authentication devices	*E.g. PINsentry.*

Topic 5 Online communities

Social spaces	
• Blogging	*E.g. weblogging, photoblogging and vlogging.*
• Microblogging	*E.g. Twitter or Facebook's 'status update'.*
• Public social networking	*Social networks (e.g. Facebook/Google+/Twitter) form connections between users' profiles through their personal information. They often use blogging/microblogging/Chat features.*
• Professional networks	*Some business orientated social networks are used to enhance users' employment opportunities e.g. LinkedIn.*
• Chat/Video chat	*E.g. MSN Messenger, Skype.*

Work spaces	
• Web conferencing	

User-generated reference sites and social bookmarking	
• Forums/message boards • Wikis	

Massively Multiplayer Online [Communities] (MMOs)	
• Virtual worlds	*E.g. Second Life.*
• Gaming communities	*E.g. MMORPGs.*

Topic 6 Issues

Legal and ethical	
• EU cookie law (e-Privacy Directive)	
• Net neutrality	*Net neutrality is the principle that ISPs and governments should treat all internet content/traffic equally.* *Not doing so can lead to content/traffic 'shaping', which is the term used to describe how, for example, ISPs could give preferential treatment to different kinds of internet traffic, such as their own video-on-demand service. This ensures an acceptable experience of that content for customers at the expense of the speed of some other services.*