Lesson plan

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| Topic 1 Digital devices |
| Learning Objectives:* Describe digital devices that form part or all of IT systems:
* multifunctional devices, personal computers, mobile devices, servers, entertainment systems
* digital cameras – still, video
* navigation systems, data capture and collection systems, communication devices and systems
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| Content |
| StarterPowerPoint Guide: Topic 1 Digital devicesAsk students to suggest five functions of mobile phones. If they simply give the name of apps they have on their phone, ask them for what functions the app provides. Go through the answer slide with students. It is likely that they will have mentioned many more functions of mobile phones than those listed.MainMultifunctional devicesMultifunctional devices have become increasingly common. For instance, a photocopier used to be a single function device that would only copy pages and a mobile phone used to only be able to make phone calls. Now there are many devices and machines which are multifunctional. Go through the answer slide which suggests some of these.Digital devices and types of digital devicesOften, students will not think of devices such as a microwave as a digital device. It is worth asking them what the input and output devices are (push buttons / dials for input, and a microwave generator (magnetron) / speaker / bell for output). Note that some microwaves are still analogue and consist simply of a timer and bell. It may be worth asking student for which devices in the kitchen are not digital devices. Examples would probably include an electric whisk and food processor. A washing machine will process the water temperature and length of a cycle.Go through the different types of digital devices. A smartphone is capable of being considered in all of the categories given.Give out **Worksheet 1** and ask students to do **Task 1.**Topic 1 Worksheet 1Topic 1 Worksheet 1 AnswersPersonal computersA PC is typically a personal computer running Microsoft Windows in the same way as a Mac runs MacOS. However, both PCs and Macs are types of personal computers. A desktop computer will contain a base unit that houses the processor and other hardware. A laptop will contain an integrated screen and keyboard and be designed for portability.Desktop vs laptopsGo through the features of desktops and laptops and ask the students to give some more advantages. Possible answers are given on the following slide.PC salesSales of PCs have been falling since 2011. There has been a significant move to portable devices such as tablets and smartphones. Smartphones have become more sophisticated, meaning they can carry out many tasks that used to be done on a PC. A move to cloud services has also meant there is less need for upgrades of computers to run the latest software.Mobile devicesWhilst it is likely that students have a good knowledge of mobile devices they may not have considered the ways that companies and organisations might use them. Go through the questions and answers slide.Ask students to do **Task 2** on the worksheet**.**Entertainment systemsMany systems that used to be analogue, such as TV and radio are now digital. Ask students if all radios are digital (they aren’t and many still use analogue signals, although the tuners may be digital). All TVs are now digital as the analogue signal was turned off. The advantage of a digital signal is that it can transmit far more information and make use of compression. This allows for more channels and high definition channels to be made available. Ask students for more advantages of digital TV and smart TV and go through the answers on the following slide.Games consolesStudents are likely to have experience of games consoles. The advantages that consoles have over other platforms include being easier to set up, easier to purchase as there are fewer options, more reliable as all parts come from one manufacturer and fewer compatibility issues with games and the developers will have tested them on exactly the same hardware as the consumer owns.ServersA server is often thought of as a dedicated machine that provides a service. Server software can actually be run on most computers. As such, a Windows PC could have a web server installed onto it and then serve websites. Typically, though, this is only done for local testing, with dedicated machines being used when many users need to use the service. Ask students for types of server they have used in the last week and go through the answers slide.Ask students to do **Task 3** on the worksheet**.**Digital camerasDigital camera sales increased in the early 2000s as the quality of CCDs (charged couple devices) which is the camera sensor, improved and solid-state storage capacities increased. Consumers now have very high-quality cameras in mobile phones and are then able to backup and share photos through these devices. This has now had an impact on digital camera sales. Digital SLR cameras are of interest to keen amateurs and professional photographers, where the range of lenses and other functionality is desirable. The very latest phones have phenomenal capabilities as shown in the case study of the Huawei P30 – considered the best camera on a phone when released in 2019.Navigation systems, GPS and what3wordsStudents should be aware of navigation systems for phones and car satnav. GPS is used to determine the position. This needs three satellites to determine the position on a road and four satellites to include the height and position. If GPS connects to more satellites, then the position can be more accurately determined. What3words is a useful way to remember a location anywhere in the world. An algorithm is used to assign words to their location, so the software only needs to be a few megabytes in size. The software is used by some emergency services in the UK to locate people.Ask students to do **Task 4** on the worksheet**.**Data capture devicesGo through the slide on data capture and ask students to suggest alternative ways that data is captured. The answers slide offers some possibilities. RFID is used in contactless payments. The advantage of this method is that it is quick and easy for consumers to use. However, if a card is lost or stolen, it can be used many times to purchase goods before a confirming PIN is requested. The technology has also been criticised as making it too easy to purchase goods without consideration and increase the likelihood of getting into debt.Communication devicesThere has been a substantial improvement in the ways that devices connect to each other and the Internet. It is worth discussing with students how these connections were made in the 1990s. Then go through the slide and answers. Note that the majority of households in the UK have Fibre to the cabinet (FTTC) which is sold to consumers as fibre. The last few hundred metres from the cabinet to the house are in fact copper cable.Ask students to do **Task 5** on the worksheet**.**PlenaryAsk students to complete the plenary task and then go through the answers. Hand out **Homework 1**. Topic 1 Homework 1Topic 1 Homework 1 Answers |