

Activity

Ask students to collaborate in small groups to make posters that display the different types of hardware. For each of the hardware types, they should write a short description of the function and usage in everyday life.

Allow each group to present their posters to other students to practise communication. Get them to discuss the advantages and disadvantages of the types of hardware available.

Workbook**Exercise 1** LINK PAGES 3 TO 7

Ask students to complete Exercise 1 in the workbook by matching the items of internal hardware with their function in question 1 and labelling all the external hardware elements in question 2.

Exercise 2

In this free activity allow students to list any external storage devices.

AO1: Recall, select and communicate knowledge and understanding of ICT

Answers LINK PAGE 000

All answers to questions in the Workbook are available at resource.marshallcavendish.com/teacher.

Students can check the answers to Let's Practice at resource.marshallcavendish.com/student. xxxxx xxxxxx

Software**Application software**

As a follow-up on the previous section, discuss the applications of a mobile phone as well as a computer.

Describe in broad terms to the students that application software performs a series of coordinated functions and tasks to aid and help the user to achieve certain purposes and intended objectives. Such applications are used in a wide variety of platforms and in many industries, whether in work-related environments or entertainment, education etc.

Ask the students to name any such applications and where they are being used.

Work through the different types of application software. If you have computers or other devices in class, encourage the students to find software and run it. Alternatively, brainstorm all the programs they know and then classify them.

Make sure they understand that 'application software' is another term for what many people call 'programs'.

Activity

- 1 Ask students to list down the different applications that they have used on their mobile phones and the features of each of the applications. Get them to present features of the applications to the class and evaluate if those features are also present in other computer devices, such as a personal computer, laptop, etc.
- 2 Encourage students to talk about the different types of application software by working back through the first section of the Student Book. For each type of application software, for instance word processing software such as MS Word or presentation software like MS PowerPoint, talk about the various functions and students' personal experiences of using the software. They can share their thoughts about the ease or difficulty in using such software.

Support students by providing them with the icons of the different types of software on mobile phones and ask them to comment on the possible applications. Encourage them to discuss this with their peers.

Challenge higher-ability students to find out more about supercomputers and artificial intelligence. For instance, you could initiate a discussion about Alphazero, Deep Blue etc. What are the possible uses of such supercomputers or computer programmes?

- 3 After the discussion, ask students to write down in their notebooks all the different applications and their corresponding features. Encourage them to share their ideas and thoughts with their classmates.
- 4 Ask students to think about and list software features of a mobile phone that are common among the different brands of mobile phones on the market.
- 5 Ask students to write a short journal on their experience, and the advantages/disadvantages, of using a particular app, for example WhatsApp for communication or perhaps Google Maps navigation software. Point out that most free apps are, in fact, not free at all, as someone always has to pay. The most common ways of apps earning money are upselling, for example offering premium paid versions with no advertising or through selling user data. Ask students which methods do Google Maps and WhatsApp use?

Workbook**Exercise 3** LINK PAGE 2

In question 1 ask students to complete the table of types of application software with their function and a name of one that they know or use.

As a follow on, ask students to list any examples of application software they have on their smart phone or tablet.

AO1: Recall, select and communicate knowledge and understanding of ICT

Answers LINK PAGE 000

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System software**Warmup**

Ask students to revisit hardware again. Tell them to list the differences between hardware and software.

As a review exercise, get students to construct a dichotomous key for hardware.

Hardware can be classified as internal and external, and in the same way, software can be classified as application and system software.

Ask the students if they know about the differences between application and system software. Give a broad distinction:

- used by user (visible)
- used by computer (invisible)

Give examples of both types, e.g. the BIOS starts up the computer and the OS gets everything ready for the user to work with, without them having to do anything. Word needs the user to do something to produce a document.

Work through the section and explain the key functions of system software. There are basically five types:

- 1 Operating system (OS)
- 2 Device drivers
- 3 Utilities
- 4 Programming language translators
- 5 Firmware

In this section, we deal with 1, 2 and 3 and touch on aspects of 4.

Explain the differences between system software and application software.

An operating system is the most common type of system software, although students may not even realise that they use it. Ask them what type of software is responsible for showing them a menu of apps or the files in their computer. This is the OS.

Encourage the students to list operating systems such as Microsoft Windows, mac OS, Linux, etc. for computers, and Android and iOS for mobile phones.

Support students by asking them to compare two familiar OS, such as the one on their phone and the one on a computer.

Challenge more able students to list the advantages and disadvantages of two or more operating systems with regards to the user experience and possible ways to interact with the operating system. Ask these students to find out the differences between proprietary and FOSS OSs and the advantages and disadvantages of both. They should consider the following:

- security and vulnerability to attack
- stability
- fragmentation of versions
- commercial vs community support

Introduce compilers, linkers, static and dynamic libraries.

Support students using analogies to help them understand better. For instance, a compiler can be viewed as a translator that translates our human language into one that is perfectly understood by the computer.

Challenge higher-ability learners to find out more about other high-level programming languages and how such languages are being used.

Introduce utility software as tools to optimize processes, configure, or maintain a computer and to support the computer infrastructure. Ask students if they have ever performed processes such as defragmentation, backup and compression.