# 2 IT systems

## Briefing

This unit aims to provide a foundation of language to be used throughout the book for talking about basic computer hardware, and screen and software operations. Students practise: large and small numbers, as they relate to system specifications; using imperatives to give instructions for using a GUI; using prepositions in sentences with two objects to describe, for example, connecting and disconnecting multimedia equipment; explaining OS installation using appropriate language to express reason and purpose.

### System specifications

This section looks at basic hardware and numbers for hardware specifications.

The hardware is divided into three categories: **peripherals** (things that you plug into computers), **internal components** and **storage**. Note that storage is different from memory in that it keeps its data after being switched off, unlike most forms of memory, which lose data after being switched off. Most storage components can be internal or external (peripherals), though nowadays external optical drives are rare.

Below are explanations of some of the items mentioned:

- A **hard disk drive** (HDD) is a storage device that holds its data on spinning magnetised disks. At the time of writing, these were beginning to be replaced by **solid state drives** (SSDs), which perform a similar function but without moving parts.
- **Optical drive** is a generic name for devices that read and write data from CDs, DVDs or Blu-ray. The name derives from the fact that they use a laser, which is an optical device.
- While **monitor** and **screen** are often used interchangeably, technically, the screen is the front part of the monitor on which the picture appears.
- The **power supply unit** (PSU) is the box inside a computer which converts mains electricity into the appropriate voltages for the internal components.

Activity 3 shows a photo of a **motherboard**, which is the main circuit board inside a computer. Items that plug into the motherboard are:

- **CPU** (Central Processing Unit) or **processor**: the 'brains' of the computer, which carries out the instructions that the software gives it. CPUs may be single-core, dual-core or more. CPUs have a speed ('clock speed'), which is usually expressed in **megahertz** (MHz).
- **DIMM** (Dual In-line Memory Module): this is a small circuit board with a number of memory chips on it. Most computers have several of these. Memory is sometimes called **RAM** (Random Access Memory).
- **Ethernet** cable: a standard network cable
- **Graphics card** (video card): this circuit board carries a separate processor, similar to the CPU but designed specifically to process imagery, mostly video.
- **SATA socket**: hard drives, solid state drives and optical drives use SATA connections.

Some common prefixes for large numbers are mentioned. In relation to these, students may bring up an issue that is controversial in IT: while **kilo-** always means 1,000 in other fields, in IT a **kilobyte** is sometimes 1,000 bytes and sometimes 1,024 bytes. Similarly, the word **megabyte** can sometimes be used to mean 1,000 kilobytes and sometimes 1,024 kilobytes. For simplicity, we've consistently used 1,000, etc. here; this follows an emerging convention of using **KB** to represent 1,000 bytes and **KiB** to represent 1,024 bytes. Similarly, using the same convention, **MB** represents 1,000 KB and **MiB** represents 1,024 KiB, and so on.

A **byte** is the smallest unit of memory used to store a single character.

**Gigabyte** is often abbreviated to **gig** when talking about memory (for example, **a four-gig memory module**).

### GUI operations

This section looks at language for giving and understanding instructions for using a **GUI** (Graphical User Interface), which is the windows, buttons, icons, menus and other elements which most programs use to communicate with users and accept input from them. GUI is pronounced 'gooey'.

Note that:

- the activities are based on Windows, only because it is the most common operating system worldwide. If you are more familiar with another operating system, such as Apple's Mac OS X or Linux, you may want to do the activities in the book before teaching the lesson.
- Folders are often called directories by people in the IT industry.
- **Dialogue box** (AmE: **dialog box**) is a window that provides information as well as asking for input from the user. For example, when saving a new document, a dialogue box shows folders and asks the user which one to save to.

## Multimedia hardware

This section is about multimedia hardware and how it connects to computers. Following on from the previous section, there is work on providing help and instructions in this area, for example, connecting a laptop to a projector and transferring photos from a digital camera to a computer. The only item which needs explanation here is **virtual reality goggles**, which are glasses with monitors on the inside which are connected to a computer, enabling the user to see a three-dimensional image.

## Operating systems

An **operating system** (OS) is the software that controls a computer. Its functions are wide-ranging and include managing the GUI, memory, storage and other hardware. Examples are Microsoft Windows, OS X (which runs on Apple computers) and Linux. Other devices such as smartphones and tablets also have operating systems; Android and Apple iOS are examples. Other concepts mentioned in this section include:

- **BIOS** (Basic Input Output System): basic software built into PCs that initialises the computer and controls it before the OS starts. Thus, it is the first program that runs when the computer is switched on. You may be familiar with it from the screen that first appears while waiting for a computer to start.
- **booting**: the process a computer goes through when it starts up. Thus, if we tell someone to **reboot** a computer, it means to restart it.
- disk **partitioning**: when a hard drive is partitioned, it is divided up into two or more sections which each act like a separate drive.
- **boot drive** (or boot partition): the drive from which the OS runs. When installing an OS, this is set temporarily to where the OS is located: for example, on a DVD.
- **product key** (or serial number): a code that is supplied with an OS or software when purchased and which is entered the first time it is run, to verify that it was obtained legally.
- **user account**: a security feature available on many modern operating systems. When you log on to a computer, you are actually logging in to a user account; each user account has its own username and password, and allows access to different parts of a computer. There are often some general user accounts, such as *Administrator*, which allows access to almost everything, and *Guest*, which has much more restricted access.
- **licence terms**: the terms and conditions that you agree to when you purchase software or sign up to a website.

## Business matters

This section focuses on **open source** versus **proprietary** software, including operating systems. Most well-known software is proprietary; in this, the programming instructions (code) are a commercial secret. Examples include Office (by Microsoft) and Photoshop (by Adobe). The code for open source software, on the other hand, is freely available and can be adapted by anyone. Examples are the Linux and Android operating systems, and the Chrome and Firefox browsers.

### Further reading

Use the following keywords to search the internet for websites which give more in-depth information about the topics covered in this unit: computer data storage, CPU, DIMM, binary prefix, GUI, operating system, BIOS, booting, disk partitioning, user (computing), open-source software.

# Teacher's Notes

## Warm-up

Ask students to share, in small groups, their lists of internal computer parts and external parts (peripherals) they made for homework. Then ask one person from each group to write words from their lists on the board to make one long list. This could be combined with Activity 1.

## System specifications

### Speaking

**1** In open class, if you think that students might know the difference between internal components and peripherals, elicit it from them. Otherwise, tell them. Then ask students to name as many of each as they can, in small groups. If, while monitoring, you notice that a student can describe the item or think of the word in their own language, you can help them by pointing at the word in Activity 2 or by providing the English word yourself.

Peripherals connect to the outside of the computer. Internal hardware goes inside the computer.
As well as the items mentioned in Activity 2, peripherals might include: microphone, memory card reader and scanner. Internal hardware might include: motherboard, cables, fans and floppy disk drive. Blue-ray drive, DVD drive and CD drive can be external or internal but nowadays are usually internal. They may be combined into the same unit and usually go by the umbrella term 'optical drive'.

### Vocabulary

**2** In pairs, students now decide whether some listed items are internal, external (peripheral) and/or storage devices. Some will be one of these and others will fit into all of these categories. Some are likely to have come up in Activity 1. This is mostly review of Book 1. If your students have not completed that book, it may be necessary to pre-teach some of the vocabulary.

**1** P, S **2** I, P, S **3** P **4** I, P, S **5** P
**6** I, P, S **7** P **8** I **9** P **10** I **11** P **12** P

### Listening

**3** ▶ 07 Students look at a photo of a motherboard, listen to someone explaining the components on it and match the components to parts of the picture. Allow students to read through the supplied vocabulary before they listen. They may need to listen a second time. Also allow opportunities to compare notes in pairs or small groups. If students need more help after a couple of listenings, you can refer them to the audio script on page 73.

**1** E **2** A **3** B **4** F **5** D **6** C **7** G

**Extra activity**

This activity is for stronger classes. In pairs, one student explains the location of a component in their own words. The other student says what the component is.

### Language

The focus here is two-fold: saying decimal numbers and using prefixes common in IT for expressing large numbers (for example, *mega-* for 'million'). You could talk about conventions in the writing of numbers that may be different in students' own countries. For example, some countries use a comma for the decimal point; this can be confusing to people from other countries in which the comma is used to separate groups of three digits to the left of the decimal point (for example, in 1,034.434). Point out that the decimal point is not stressed.

**4** Students match prefixes to the numbers they represent. While students do this, make sure they are saying the numbers correctly, following the first focus of the Language box (for example, *nought point nought nought one*). It may help students to think of the abbreviation for the numbers in their own language; *KB* is used for 'a thousand bytes' in many languages.

**1** tera- **2** giga- **3** mega- **4** kilo- **5** nano-
**6** micro- **7** milli- **8** quad- **9** dual-

### Pronunciation

**5** ▶ 08 Ask students to predict where the stress lies in the examples. They may have some instinct for this from previous listening; even if not, the experimental aspect of doing this will help make the stress patterns memorable. They then listen to check their predictions.

**1** a dual-core processor **2** a quad-speed Blu-ray drive **3** a 3.5-millimetre socket
**4** a micrometre **5** 18 nanometres
**6** a 26-kilobyte file **7** 2.4 megahertz
**8** 4 terabytes

**Extra activity**

Ask students to write down their own phrases similar to those in Activity 5, which could represent their own computer or a computer they want. They then practise saying them in pairs, with appropriate stress.

## Listening

**6** ▶ 09 Ask students, before they listen, to familiarise themselves with the delivery slip. They can practise saying the specifications with correct stress and with the correct way of saying the numbers. Then tell students that Dingle Digital got the order wrong and delivered computers with incorrect specifications. They then listen to a conversation between two people working at Wood Publishing and mark the mistakes on the delivery slip.

**Laptops**
- 1 x 390 GB SDD → 1 x 500 GB SDD
- 8 GB dual-channel DDR3 ... → 16 GB dual-channel DDR3 ...
- ...WLED 1920 x 1080 screen → ... WLED 1366 x 768 screen

**Desktops**
- Entel 3.4 GHz quad-core CPU → Entel 3.4 GHz eight-core CPU
- 1 x Eastern Digital 2 TB ... → 2 x Eastern Digital 1 TB ...
- 4 x USB ports → 8 x USB ports

A good follow-up question is: *Why doesn't the IT manager want to complain about incorrect screen resolution?* (It's better than the one they ordered.) If your students have some IT knowledge, you could also ask: *What is an advantage of having two 1 GB drives compared with one 2 GB drive?* (Users can back up internally to the second hard drive. Some software runs faster if the program is on one drive but the data on another.).

## Speaking

**7** To further practise the language, students roleplay the conversation that the Wood Publishing manager will have with the supplier, describing the problems with the order.

**8** First, students write down some specifications, which might be completely made up, for their own computer or their ideal computer. Then they ask and answer questions about these. While the questions use the present simple and are thus review from the previous unit, there are some features that may be a little tricky, so it may be useful to model appropriate questions and answers in open class and/or put them on the board (eliciting as appropriate):
*A: How much memory does it have?*
*B: It has 16 gigabytes.*
*A: How big is the hard drive?*
*B: It's ...*
*A: What is the screen resolution?*
*B: It's 1280 x 1024*
This activity can be done as a mingle.

**9** In pairs, students suggest real-world specifications for computers in the given situations. Brochures (online or print) would be useful here, especially for those who do not have a lot of IT knowledge. Below are some additional hints that may help those with less IT knowledge:
1 Basic office software does not need powerful computers.
2 Powerful software such as Adobe Creative Suite needs powerful computers with lots of memory and, probably, SSD drives. They often also need to fit large pictures and films on their screen.
3 Provides data and so on for other computers but does not usually have people sitting at it or doing work on it.
4 Sales people travel a lot to visit clients but the software they use does not need a lot of power.

*Suggested answers*
(Accept anything students can justify.)
**1** Quite basic. Large screen is useful for viewing several documents at once. Processor speed, memory and hard drive size are not so important.
**2** Faster processor, much more memory, bigger (and probably more) hard drives, bigger graphics card than 1. Such computers often have dual monitors (a useful expression to teach).
**3** Will also have a faster processor, more memory and bigger hard drives but graphics and screen are less important. Both might even be absent.
**4** Similar to 1 though more portable. Low specifications may be useful as they often go hand in hand with longer battery life.

## GUI operations

### Speaking

**1** Ideally, this activity would be carried out with a computer screen visible to all students, though this is not essential. Ask students what they can do with a computer window, giving an example (make it smaller) to get them started. They may respond with gestures, in which case you can supply the appropriate language.

*Suggested answers*
resize it, move it, open it, close it, make it bigger, make it smaller

### Vocabulary

**2** This activity looks at vocabulary for various parts of windows and dialogue boxes. Students annotate a screenshot of a window and a dialogue box. The screenshot is from Windows 7.

**1** A **2** L **3** F **4** G **5** B **6** K **7** J
**8** C **9** I **10** E **11** D **12** H

**3** Students now look at actions that can be carried out on windows. They match the beginnings and endings of imperative sentences. Note that:

- *on* after *click* may be missed out: it is possible to say *click the title bar* rather than *click on the title bar*.
- the new menu that appears in item a is called a context menu or a pop-up menu.

**1** b **2** f **3** a **4** e **5** d **6** c **7** g

**Extra activity**

If students are familiar with other operating systems such as Mac OS or varieties of Linux, ask them to talk about how the actions are different in those operating systems. Students may need a model for how to express this: *In Windows, you double click on the title bar to maximise the window. But on Mac OS X, you double click the title bar to close the window.*

### Listening

**4** ▶ 10 Tell students that they will listen to a help desk technician talking to an IT user. For this first listening, they just listen for the main idea: what information does the technician want?

a date/the install date

**5** Students listen again, this time for specific information: they number the boxes to indicate the order they hear the information. Before listening, students should familiarise themselves with the instructions.

**4** Choose 'Properties' from the menu.
**2** Just select 'Manage'.
**6** Select 'Install date'.
**5** Choose the 'Details' tab.
**3** Just right-click where it says 'Disk 0'.
**1** Can you scroll up to the top?

### Language

Students have already encountered imperatives in Unit 1. Here, they use them for a different purpose (giving instructions), with softeners to make instructions sound more polite and sequencers to show the order of instructions.

**6** Students use the information in the Language box to identify and underline the imperatives in Activity 5. Ask students to look at the audio script for the conversation in Activity 5 on page 73, and find out whether only imperatives are used or other forms as well. They should notice that requests are used as well (*Can you ...?* ). Point out that those using only imperatives can sound rude, even if softeners are also used.

**Imperatives**
**2** Just select 'Manage'.
**3** Just right-click where it says 'Disk 0'.
**4** Choose 'Properties' from the menu.
**5** Choose the 'Details' tab.
**6** Select 'Install date'.
**Softeners**
Just, can you ...?

### Speaking

**7** Students now roleplay conversations similar to the one they heard in Activity 5. An example and prompts are provided. If your class has access to computers, this activity is best done in front of a computer. The instructions work for Windows 7 with Mozilla Firefox and Google Chrome installed.

**8** Students now apply the language to real life by explaining to their partner something they know how to do. Prompts are provided for common actions most people who have used computers can do. You may want students to think of their own ideas or, as a class, come up with some actions that students know how to do.

### Writing

**9** To consolidate the work from this section and to practise some writing, students write an email explaining the steps they roleplayed in Activity 7. They should use the organisation pattern that they looked at in Unit 1: general information first (the purpose of the email), with the more specific information later (the steps).

## Multimedia hardware

### Speaking

**1** To lead in to this activity and provide a link with the previous section, ask students to say which peripheral device they used most recently. Then ask them how often they use this device, as review of the frequency expressions in Unit 1. Students can then discuss the questions in Activity 1, using the frequency expressions.

### Vocabulary

**2** Ask students if they already know the words for some of the items in the photos. Then ask them to match the other items to the photos.

**1** speakers **2** projector **3** headphones
**4** virtual reality goggles **5** microphone
**6** video camera **7** webcam

### Speaking

**3** To practise the vocabulary and relate it to real life, students talk in pairs about who might use the items in Activity 2.

### Reading

**4** Ask students how to connect multimedia peripherals to computers. This may review some vocabulary from the first section (*socket*, *USB port*, etc.) and also leads in to the reading, which is about connecting a projector to a laptop computer. Students skim the email to find out what Kamal wants to do.

If students mention that on some computers some of these steps are automated, you can point out that it is often the trickiest issues involving older hardware that they will be asked about while working in IT jobs.

He wants to connect a projector to a laptop.

### Vocabulary

**5** Using the email, students match words to their synonyms. Pairwork may be useful here.

**1** d **2** c **3** b **4** f **5** g **6** a **7** h **8** e

**6** Using the email, students add the appropriate preposition to the verbs. After checking answers, elicit the pattern: *to* is used for connecting and *from* is used for disconnecting.

**1** connect to **2** plug into **3** unplug from
**4** disconnect from

### Language

This focuses on the grammar of the vocabulary above. Most of the verbs in Activities 5 and 6 can take two objects. Point out that we often use a preposition between the two objects, as described in the Language box.

**7** Students complete the gaps with one or two objects and with appropriate prepositions. The first word is provided, so students have to paraphrase rather than simply repeat parts of the text, thus they have to focus on the meaning of the words. Make sure that students are aware that they should write one object for some of the verbs and two objects for others.

*Suggested answers*
**1** Plug the projector cable into the laptop/ laptop's video socket.
**2** Plug the (projector's) power cable into an electricity/a power socket.
**3** Switch on the computer.
**4** Push the 'Function'/'Fn' key and the key with a screen picture at the same time.
**5** When finished, turn off the computer and projector.
**6** Disconnect the projector from the computer.

### Writing

**8** In preparation for writing their own emails, students look at the example email and identify some features: greeting (salutation), paragraphs and signing off. They then think of other phrases that could be used for the greeting and signing off. If your students have only a little prior experience of seeing emails written in English, this could be done in open class rather than in pairs. If you feel it is appropriate, you could also ask students to identify where the main idea of each paragraph is (at the beginning, in what is often called a topic sentence). This links with the

writing point from Unit 1 – that usually the more general ideas come first and the more specific points later.

- the greeting = Hi Kamal
- Paragraphs are indicated by the gap between them.
- signing off = Best wishes

Other greetings could include:
- Dear (formal, such as when writing to people much higher in the company hierarchy; in some contexts this could be overly formal and distant and thus indicate a poor relationship between the sender and the recipient.)
- Hello (unusual)

Other ways to sign off could include:
- Kind regards,
- Best,
- Regards,

**9** Students write an email explaining how to transfer photographs from a digital camera to a computer. Prompts are provided, though there is more than one way to do this and students may use a different procedure. You could remind students about the sequencers from earlier in this unit, which they could incorporate into their emails.

## Operating systems

### Reading

Before beginning this section, check how much your students know about operating systems. You could ask the following (depending on your students' prior IT experience):

- *What operating systems can you name? What versions of these operating systems do you know?*
- *Which operating systems do you use most often?*
- *Which is your favourite? Why?*
- *Have you ever installed an operating system by yourself? Was it easy or difficult?*

**1** Students put the steps in installing an operating system in order. If only some of your students have experience of doing this themselves, it will help to put one with this experience in each pair/group. However, even with no experience, students working together should be able to use clues such as sequencers.

**6** During the process, the computer will restart by itself several times.
**7** Near the end of the process, you can partition the hard drives.
**3** In the BIOS, set the first boot drive to DVD. Then reboot again.
**8** At the end of the process, the operating system will ask for the product key, time, date, network type and details for user accounts.
**2** First, put the installation DVD into the optical drive. Then, reboot the computer while you press the 'F2' key. The BIOS will now start.
**4** This time, the computer will boot from the DVD and installation will begin.
**1** Before you start, back up everything.
**5** Near the start of the process, it will ask you to agree to the licence terms.

### Vocabulary

**2** Students use the context of the steps in Activity 1 to find words there that match the definitions.

**1** restart **2** partition **3** BIOS **4** boot drive
**5** product key **6** user account **7** reboot
**8** process **9** back up **10** licence terms

### Language

Four ways of expressing reason and purpose are dealt with here. Most students at this level will be aware of most of these. In addition to the points in the Language box, elicit, using examples, that if the *because*-clause is the second clause in a sentence, there isn't a comma between the clauses, whereas if it is the first clause, a comma is required.

**3** Students match sentence halves, inserting *because, so, to* or *for* between them as appropriate.

**1** d, for **2** e, so **3** a, to **4** f, because
**5** c, to **6** b, so

### Speaking

**4** Students roleplay a conversation in which an IT user is asking questions to an IT technician relating to the items in Activity 3.

**Extra activity**

Students ask and answer the following questions (or ones they write themselves) in pairs. Students with less IT experience will need time to think about their answers.

1 *Why might people change their operating system?*
2 *Why are windows useful?*
3 *Why might a sales person use a webcam?*
4 *Why is a large hard drive useful?*
5 *Why do some people use laptops, not desktops?*

*Suggested answers*

1 To upgrade./Because they want new features./So that they can have different features./For the new features.
2 To see several files at the same time./To run several programs at the same time./Because they help you run several programs at the same time.
3 For video calls./To communicate using video./To make video calls.
4 To store lots of data./For storing lots of data./Because some people need to store lots of data./So that you can store lots of data.
5 Because they're easy to carry./Because they're not heavy./Because they need their computer while travelling./To carry easily.

## Business matters

**1** Elicit from students or provide some examples of open source and proprietary software (see Briefing section). In groups, students discuss what they know about these different categories of software. Some prompts are provided to help them, though if your students' IT knowledge is limited, this might be best done in open class.

### Reading

**2** Students read a short article about open source software. While doing so, they check the points they discussed in Activity 1. The answers can then be discussed as a class.

*Suggested answers*
Open source software is usually free, whereas proprietary software usually has a price.
Open source software can be written by anyone, from people who program as a hobby to large companies.
Proprietary software is more common in everyday computer applications than open source software (though in some situations, for example, on servers, open source software is quite common).
Some names of open source software may be mentioned, such as Linux (common varieties of which are Ubuntu, SUSE, Red Hat), OpenOffice, Libre Office, Android (for mobile phones) and GIMP (an open source alternative to Photoshop).

### Listening

**3** ▶ 11 Students listen to a spokesperson from a company that sells proprietary operating systems, giving the opposite point of view from the reading.

Ask students to listen once before they answer the question and count the number of points made (three). Then play the recording a second time for students to list the points they hear.

cheaper training and free support
better quality: more features, better looking, fewer bugs (because they pay their developers)
more applications available

### Speaking

**4** Students go back to the article in Activity 2 and make a list of reasons to favour open source software, which should contrast with the list they made in the previous activity. They then compare answers in pairs or small groups, giving reasons, and discuss any differences.

*Suggested answers*
free
freedom/independence from the vendor
can add features
have control over data

**5** To help students prepare for this activity, ask them to discuss the following questions in small groups: *Do you believe everything the company spokesperson in 3 says? Why/Why not?* (Answers may include the point that a company spokesperson is likely to prefer the company's products over others.) *In total, which do you think is cheaper: open source or proprietary software? Consider purchase cost, support cost and training cost.* (Answers may include the points that open source might be cheaper if little support or training are needed. Otherwise, proprietary software with free support and/or training might be better.)

Students then read an email from a manager about replacing computers in two departments. In their groups, they decide whether to choose open source or proprietary software in each department. They may choose different solutions for each department.

### Writing

**6** Students write an email in reply to the one in Activity 5, giving their recommendations. They should use the language of reason and purpose from page 18 and the email conventions they looked at in the previous section.

## Preparing for the next unit

For homework, in preparation for **Unit 3**, ask students to list as many ways of communicating electronically as they can and to look up the English words for each item.