BASIC SOFTWARE. THE OPERATING SYSTEM

INTRODUCTION | BASIC SOFTWARE & THE OPERATING SYSTEM

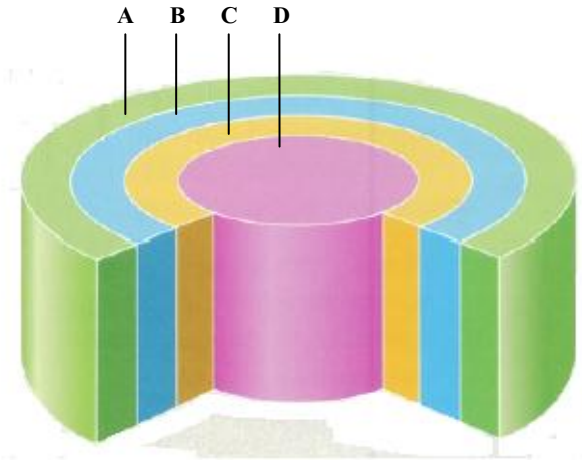
1 Working with a partner try to find the answers to the following questions:

1 Try to define, in your own words, the term '*operating system'*

.....

.....

2 Try to label the diagram (A-D) below with the following captions: *applications program, user, hardware, operating system*:



A - .....

B - .....

C - .....

D - .....

3 What is the main difference between systems software and application software?

.....

4 What are the main tasks an operating system has to perform?

.....

.....

.....

.....

.....

5 In what way are modern operating systems different from the operating systems of the past?

.....

.....

VOCABULARY | BASIC SOFTWARE

2 Solve the crossword below.

Across

1 programs which tell the computer what to do

3 any set of instructions for a computer

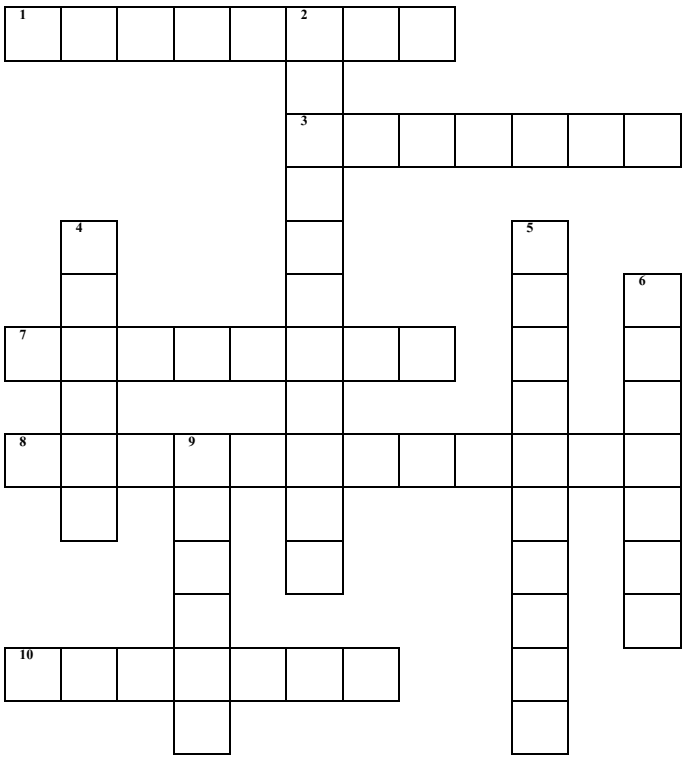
7 software which prevents unauthorized access to your computer over the internet

8 a series of letters and numbers which you have to enter before installing some programs (2 words)

10 an unauthorized copy of a program

Down

2 a piece of software which makes a computer do a task (e.g. edit an image)



3 Match the following terms with their definitions

1	point-and-click interface	**a**	software that is announced, but appears late or not at all;
2	system call	**b**	a GUI interface where an action is selected by placing a cursor over its depiction on the display using a pointing device;
3	killer app	**c**	a computer program that is the core of a computer's operating system with complete control over everything in the system;
4	vapourware	**d**	software that manages different parts of display screens separately; a type of GUI which implements the WIMP paradigm;
5	supervisor program	**e**	the programmatic way in which a computer program requests a service from the kernel of the operating system;
6	kernel	**f**	a program that remains in memory at all times;
7	windowing system	**g**	a program that controls the execution of other routines and regulates work scheduling, I/O operations, error actions, etc.
8	resident program	**h**	a computer application of such great value or popularity that it assures the success of the technology with which it is associated;

1	2	3	4	5	6	7	8

4 Read the following text on how operating systems work and complete the gaps in the text with an appropriate word or phrase from the box below.

applications programs	*booting*	*bootstrap*	*block size*	*block*
device drivers	*GUI*	*interface*	*memory manager*	*multitasking*
supervisor program	*system call*	*system managers*	*system memory*	*user interface*

The operating system provides a(n) (**1**) _____ between (**2**) _____ (e.g. word processors or spreadsheets) and the computer hardware. The most important program in the operating system is the (**3**)_____, which remains in memory all the time the computer is operating and manages the operating system as a whole.

When every operating system turns on, a self-sustaining snowball style process, known as (**4**) _____ must complete an animated chain of functions that gradually increases access to system hardware and control. Once this is done, the OS becomes completely responsible for detecting what it and all the other programs need from the hardware and supplying that quickly. As part of the (**5**)_____ process, special pieces of software, called (**6**) _____are also loaded, allowing hardware makers to write the code once and allow it to work on a wide variety of systems running on the same or even just similar operating systems.

As soon as you start to interact with your computer, the software you are using will send out something called a (**7**)_____, which specifies a task a hardware component must perform in order for that software to continue functioning and to send further requests. Once the operating system has registered these requests, it then gathers them for organization and processing. When a program is first initiated and needs (**8**) _____in order to get up and running, it sends out a call which is received by the OS (**9**) _____Once that call has been translated to the hardware's language, the OS then slots it into an active queue, based on the memory it feels is necessary, otherwise known as the (**10**) _____ When the program is later closed, the OS will terminate the (**11**)_____which you have previously allocated for it and reserve them for other programs or just leave them empty if needed. In this fashion, the OS is constantly receiving calls, altering queues, using (**12**)_____ for everything from processes to files, to networks and devices.

But how does the OS determine which programs are the most important? Well, it's based on what we click on, of course. The second and most confounding function of an operating system is to provide us with a (**13**) _____.This includes everything from the sign-in buttons to the taskbar design. And if done correctly, the (**14**) _____basically gets out of the way so we can tell the computer what to put at the top of the queue, maybe for example by maximizing it on the whole screen, while others remain in the background. This is otherwise known as (**15**) _____, which allow modern operating systems to share resources between different tasks, especially ones running in the background and the ones you are actually focused on.

READING COMPREHENSION | A BRIEF HISTORY OF THE OPERATING SYSTEM

5 Read the text and solve the exercises that follow:

A BRIEF HISTORY OF THE OPERATING SYSTEM

If there is one thing that defines modern computing, it is the operating systems that we rely on to make our computers work. Over the past few decades, OS development has gone hand in hand with the rapid development of computer technology. Fast and efficient digital transactions are taken for granted these days, but over the counter purchases, a hiccup-free database search or smooth download from the web; but none of this would be possible if the operating environments for our computers hadn't gone through radical changes since their inception.

The earliest computers didn't have an operating system at all; they were mainframes on which programs were coded and run individually. Computers from this era were started with a rudimentary 'loader' program that could be used to configure the system to run the main applications program.

As the speed and processing power of computers progressed, this individual approach to running programs became more and more inefficient. Since computer run time was an expensive resource, there was an urgent need for finding a solution to allow the management of separate tasks and prioritization of workloads.

The first leap forward in the development of operating systems came when people started to realize that computers could use software to manage their workloads. Idle time was reduced by having users set up their data on punched cards offline before submitting them to the computer room for execution.

Operators would then collect users' punched cards and input several jobs onto magnetic tapes. Jobs would then be read by the computer one at a time, in a sequential manner from the tape, and be processed in what is known as batch processing. But this type of operating was slow. Many hours might pass, before output from a single job was produced, due to the fact that jobs could only be completed consecutively from the tapes.

The 1960s saw the emergence of hardware interrupts data channels, large core memory and random access on secondary storage. The running of several programs at once could now be simulated by processors, which handled input/output operations simultaneously, in a scheme called multiprogramming, which ultimately led to operating systems becoming more and more complex. Programs had to be assigned individual portions of memory and prevented from accidentally overwriting another program's memory area. A technique called virtual memory was developed to enable disk drives to be treated as an extension of the main memory, with data being swapped to and from the disk as necessary, allowing computers to run more and larger operations.

In spite of all these developments, operating systems during this time were still mostly tied to mainframe computers, due to their large size and high demand for powerful hardware components. Things started to change however, around the 1970s, when operating systems slowly started to surface on personal computers as well, as a result of the emergence of microprocessors and the ROM.

It wasn't until the 1980s however, that personal computers started to take over the mainframe industry. Due to the constant lowering of hardware prices, and the ubiquity of microprocessors, computers started to become not only cheaper but also more powerful than their predecessors. This ultimately led to the appearance of more complete operating systems, being the first ones designed to run on personal computers, in the form of the Apple DOS, CP/M and MS-DOS for IBM PCs. These operating systems provided facilities such as file systems for floppy or hard disk, and a command-line interface for running programs or system utilities, but they could only run one program at a time.

While the MS-DOS made for an extremely effective operating system in experienced hands, more casual users found it difficult to learn to use it quickly or effectively. What was needed was a more intuitive way of operating computers, ultimately leading to the appearance of the graphical user interface or GUI.

Although GUIs entered the mainstream thanks mainly to Apple's Macintosh and Microsoft Windows' for IBM-compatible PCs, they were not the first ones to come up with the idea. In fact, the first GUI resulted from experimental work at the Xerox Palo Alto Research Center (PARC) during the 1970s. The main benefit of the GUI was that it allowed users to click on icons to open programs and files instead of having to memorize and type in commands to perform the same jobs.

The first Microsoft operating system to feature a GUI under its own name was the Windows 1.0, released in 1985. This early version of windows, however, was not an entire operating system, but rather, it featured a graphical operating environment, extending the functionality of MS-DOS and which didn't garner much popularity. Things picked up slightly with Windows 2 which supported the new Office and Excel software, but Microsoft's real big success story came with Windows 3, with a new and drastically improved user interface. Success was continued with a 3.1 release that added several minor but key features, including the much maligned BSOD (Blue Screen of Death).

The popularity of the graphical user interface grew constantly, and thus it happened that by the mid-1990s, the GUI had supplanted text-based operating systems such as MS-DOS for most PC users. In 1995, Microsoft began to break its links with MS-DOS, signaled by the release of the highly popular Windows 95 operating system. Elements of the now familiar Windows GUI, like Plug and play and the Start Menu appeared. Perhaps Microsoft's greatest achievement was to make the operating system a consumer commodity, easy to install and configure, and not tied to the hardware you buy.

The biggest change that has driven development in the technology and design of operating systems has been in its liberation from the desktop. Operating systems are no longer confined to the PC or the laptop. Smartphones, tablets and other mobile devices have created a need for new and more flexible operating systems. Computing is mobile and often

takes place on and between devices. Cloud computing and distributed operating system management had opened up new ways of interacting with our smart devices and we are seeing a new age of operating systems that has probably only started to take shape.

So what does the next twenty years hold? It's hard to tell, but one thing is certain, that interfaces will make use of more human senses to display information and to control the computer. Interfaces will become more transparent, more intuitive and less set around items such as boxes, arrows or icons. Human gestures will be more commonplace and such interfaces will be incorporated into technology throughout the world, through virtual and augmented reality.

6 Choose the answer according to what you have read:

1 According to the text, the first major advancement in the development of operating systems was due to the fact that:

a computers started to become more and more powerful.

b 'loader' programs were used to run the main applications program.

c people realized that computers could perform multiple tasks using punch cards and magnetic tape.

d people realized that individual pieces of software could be used to manage and prioritize workloads.

2 Personal computers started to take over mainframes because:

a complete operating systems for personal computers started to appear.

b the price of hardware components started to fall and microprocessors became more widely available.

c the GUI was invented at Xerox PARC, allowing intuitive control over the PC.

d the development of virtual memory allowed the processing of larger and more complex data on smaller machines.

3 The main benefit of the GUI was:

a it was visually more appealing.

b it finally allowed average people to use the computer.

c people no longer had to remember commands.

d it led to the release of Windows 1.0.

4 According to the author, the most important contribution of Microsoft in the OS development was:

a the introduction of the Start Menu.

b the development of the command-line interface.

c the introduction of Office and Excel software.

d dissociating operating systems from hardware that users bought.

5 According to the text, operating systems in the future:

a will be more diverse.

b will not use the graphical user interface anymore.

c will be replaced by virtual and augmented reality.

d will be based more on gestures and senses than they are now.

7 Decide whether the following statements are True (T) or False (F):

1 The development of hardware components greatly influenced the development of the operating systems. **T / F**

2 The invention of the GUI was the main reason for the appearance of operating systems designed for personal computers. **T / F**

3 Windows 1.0 was the first operating system to support a graphical user interface as we know it today. **T / F**

4 According to the text, it was probably due to Microsoft Windows' operating systems that modern day operating systems are not necessarily tied to hardware anymore. **T / F**

8 Find words / phrases in the text that have the same meaning as the words from the following list.

commencement = _____

simple = _____

gather = _____

criticized = _____

self-explanatory = _____

pervasiveness = _____

replaced = _____

GRAMMAR | ARTICLE USE IN EGLISH

The definite article	
The definite article can be used with both singular and plural countable nouns and uncountable nouns. It is used: • to refer to a specific noun we think is known both to ourselves and our listener / reader to refer to a specific example of something • with objects which we consider to be unique such as *the Sun, the Moon*, etc. • with certain geographical features such as seas and oceans, rivers, groups of islands, mountain ranges and some countries	• to describe people of a particular nationality • with certain adjectives used as nouns • with titles • in the superlative form of adjectives • with a singular noun to make a generic reference to a group • in the titles of newspapers in which case it is capitalised • with musical instruments
The indefinite article	
The indefinite article is used with singular countable nouns only and we use it: • to talk about something when we assume our listener / reader does not know which specific thing we are talking about • to talk about different kinds of measurements	• to refer to somebody who is unknown to us • with a singular noun to make a generic reference to a group
The zero article	
No article is needed: • before names • before names of meals • before most street names • when referring to certain public places when we want to talk about their function rather than a specific building	• when we use plural nouns or uncountable nouns to talk about somebody or something in general • before certain geographical features - lakes, mountain peaks, continents and countries

9 Complete the text below with *a, an, the* or *Ø (zero article).*

Linux is (**1**) _____ operating system and it was initially created as (**2**) _____ hobby by a young student, Linus Torvalds, at the University of Helsinki in Finland. Version 1.0 of the Linux Kernel* was released in 1994. (**3**) _____ Kernel, at the heart of all Linux systems, is developed and released under GNU General Public License, and its source code is freely available to everyone.

Apart from the fact that it's freely distributed, (**4**) _____ Linux's functionality, adaptability and robustness has made it the main alternative for proprietary Unix and Microsoft operating systems. IBM, Hewlett-Packard and other giants of the computing world have embraced Linux and support its ongoing development. More than (**5**) _____ decade after its initial release, Linux is being adopted worldwide, primarily as (**6**) _____ server platform. Its use as a home and office desktop operating system is also on the rise. The operating system can also be incorporated directly into (**7**) _____ microchips in a process called (**8**) _____ embedding, and it is increasingly being used this way in appliances and devices.

* The Kernel provides a way for software and other parts of the OS to communicate with hardware.

10 Underline the most suitable option.

1 *The / Ø* software engineering is fast becoming *a / the* popular career choice worldwide.
2 It's *a / Ø* long time since I met *a / Ø lovely* person like you!
3 Diana has *a / Ø* degree in *the / Ø* computer science from *the / Ø* University of London.
4 At *the / Ø* present moment, *the / Ø* man seems to have *the / an* uncertain future.
5 *The / Ø* problem for *the / Ø* today's students is how to survive financially.
6 *The / Ø* French are very good at programming.
7 Brenda is *the / Ø* ideal for *a / the* job. She has *a / Ø* wealth of *the / Ø* experience.
8 *The / Ø* safety at *the / Ø* work is *a / Ø* major concern for us.
9 *The / Ø* most of *the / Ø* life is *a / Ø* matter of getting on with *the / Ø* others.
10 Please do not turn on *a / the* computer in *a / the* computer lab.

MIXED | PROPRIETARY VS. OPEN-SOURCE

11 Work in small groups and think about the following questions:

1 What do you know about open source software?

.....

2 How is open-source software different from proprietary software?

.....

3 What are the main advantages and disadvantages of each?

.....

12 Read the web article and compare the information found within with your own answers:

Open source: the way forward?

With open source software, what do people think about first? Money, usually, because open source software is free. But this isn't the only important thing. First, there is freedom in the number one reason to choose open source software. With open source software, an organisation doesn't have to follow the software vendor's decisions. With proprietary software the vendor controls software updates. For example, users can't add features to proprietary software themselves, but they can add features to open source software.

Also, with open source software companies have more control of their data. Proprietary software often stores data in special ways that only the vendor understands. So, when a company wants to change to another vendor's software, moving the data to the new software can be very difficult. Open source software is different; open source software vendors explain their data clearly and openly so that they are not a secret. Because of this, moving data is not a problem.

Sometimes people worry about open source operating systems. They think that their favourite software won't run on open source operating systems. However, this isn't true, because there is a lot of office software, such as word processors and spreadsheets, for open source operating systems. In fact, there are many kinds of this software and they work well. It is only special areas, such as graphics design, where proprietary software is clearly better.

13 Listen to a spokesperson for a major operating system company giving a speech: 'Why open source is a bad idea.' What reasons does the speaker give to use proprietary software? Make a list.

....

....

....

14 Use the article in the exercise above to make a list of reasons to use open source software. Then work in pairs. Give reasons for your answers and discuss any differences.

SPEAKING | CONFLICT CARDS

15 Work in groups. Each group will receive a card with the description of a given situation / scenario. As a group decide how you will tackle the situation and come up with a good communicative strategy to solve the problem which was described. Then delegate a person to role-play the situation in front of the class.

WRITING | INTRO

16 Work in small groups. You are technicians in an advertising company. You look after operating systems and software. Look at this email from your manager and decide whether to use an open source OS, a proprietary OS or some of each. Then explain your decisions to the class.

Hi Peter,

We need to replace the computers in our administration office and our design office. The administration staff are using old computers that need upgrading. The design staff need to keep the software they are currently using.

What are your recommendations for operating systems? Please let me know.

Many thanks,

Yuriko.

17 Write an email to your manager giving your recommendations.