

ICT IGCSE Theory – Revision Presentation

1.1 Hardware and Software

- Define hardware as consisting of physical components of a computer system
- Identify internal hardware devices (e.g. processor, motherboards, random access memory (RAM), read-only memory (ROM), video cards, sound cards and internal hard disk drives.
- Identify external hardware devices and peripherals (such as monitors, keyboards, mice, keyboards, printers as input and output devices and external storage devices in general)
- Define software as programs for controlling the operation of a computer or processing of electronic data
- Identify the two types of software – applications software and system software
- Define applications software (e.g. word processing, spreadsheet, database management systems, control software, measuring software, applets and apps, photo-editing software, video-editing software, graphics manipulation software)
- Define system software (e.g. compilers, linkers, device drivers, operating systems and utilities)

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1.1 Hardware and Software

Define hardware as consisting of physical components of a computer system

What is Hardware?

- Hardware are the **physical components** which make up the computer system.
- Each item of hardware have their **specific roles** in a computer system.
- Hardware components can either be **internal** or **external**.



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1.1 Hardware and Software

Internal hardware devices

Central Processing Unit (CPU)



The **CPU** is the 'brain' of the computer. It is the device that carries out calculations to complete software instructions.

Motherboard



The **motherboard** is circuit board which is connects to main components of the computer system.

Memory



Any data or instructions that are to be processed by the CPU must be placed into main **memory**.

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Internal hardware devices

Graphic Video Cards



A **graphics card** is a device that attaches to the motherboard to enable the computer to process and display graphics.

Sound Card



A **sound card** is a device that attaches to the motherboard to enable the computer to input, process, and deliver sound

Internal Hard Disk



A **hard disk** drive is a hardware device that's used to store information like software and files. The capacity of hard drive ranges from GB to Tera Bytes.

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Internal hardware devices

Network Card



A **network card** provides the computer with a network (internet connection) either through wireless signals or a physical cable connection.

Optical Disk Drive



The **optical disk drive (CD/DVD/Blu-Ray)** allows for optical disks to run on the computer. Also some optical disk drives are able to **write** “burn” data onto discs.

Power Supply



The **power supply** is connected to main power sources to give power to the computer system. The power supply connects to all the main components of the computer system including the motherboard, hard drive, optical drives etc.

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External hardware devices

Input Hardware Devices – Input data into a Computer

Examples

- Mouse
- Keyboard
- Microphone



Output Hardware Devices – Outputs data from a computer

Examples

- Monitor
- Speakers
- Printers



External Storage Devices – Provides external storage or backup solutions

Examples

- External Hard drive



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Computer Software

What is Software?

Software is a **collection of instructions** that can be 'run' on a computer. These instructions tell the computer what to do.

Software is **not a physical thing** (but it can of course be stored on a physical medium such as a CD-ROM), it is just a bunch of codes.

For a computer system to be **useful** it has to consist of **both hardware and software**.



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Applications Software and System Software

Application Software

Examples

- Word Processor
- Spreadsheet
- Databases

Application software are designed to allow users to complete specific tasks. This may be to:

- Write a letter/Present information
- Browse the internet
- Manipulate data in a spreadsheet or database
- Manipulate graphics, sound or video.



System Software

Examples

- Operating Systems
- Device Drivers
- Utilities (antivirus)

System software are normally involved in the running of the computer:

- Operating systems to provide a user interface
- Device drivers which allow hardware components to work.
- Utility software which maintain the computer performance.



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Application Software Examples

Word Processing

The screenshot shows the Microsoft Word 2003 application window. The 'Format' menu is open, and the 'Text' option is selected, leading to a sub-menu where 'Justify' is highlighted. The document content includes a title 'Fabrication journal' and several paragraphs of text. The status bar at the bottom shows 'Page: 1 of 1' and 'Words: 100'.

- Create New or edit existing text documents.
- Formatting tools
- Create font styles
- Importing tables/images
- Spell Check
- Copy/Paste
- Find/Replace
- Page layout

Spreadsheet

Account	Amount	Reference	Amount	Account	Amount
Barkleys	1,895.26	H&B- Visa	-55.86		
Indonesia	544.54	Barclayscard	6.80		153.90
Inst Trust	6.00	Amex	9.00		
Ashley	200.00	Others	0.00		
					153.90

Date	Account	Type	Reference 1	Reference 2	Analysis	Amount
01/01/01	Barkleys	Chq			Master Charge	450
01/01/01	Barkleys	Standing Order	Chq & Co		Plant	340
01/01/01	H&B- Visa	Chq	Chq		Food	1,138
01/01/01	Barkleys	Debit Card	Chq		Industries	208
01/01/01	Ashley	Inst Interest			Interest Received	0
01/01/01	H&B- Visa	Chq Payment	Sachin's		Inst	200
01/01/01	H&B- Visa	Chq Payment	Staples		Stationary	20
01/01/01	Barkleys	Chq Payment	Phu Cat		Preferential	200
01/01/01	Nationwide	Cash Withdrawal			Cash Withdrawals	-200
01/01/01	Barkleys	Direct Debit	Colgate		Subscriptions	30
11/01/01	Barkleys	Chq	Morgan & Thurman		Food	40
12/01/01	Barkleys	Chq	Wesco		Food	42

- Use of various formulas to carry out set tasks:
 - Sum, Max, Min, Average
 - Count, CountA
 - CountIf & SumIf
 - Lookups
 - IF and Nested Ifs
- Apply various formatting to cells/
- Create graphs (Ba/Pie charts)

Database




1. *Chlorophyll a* (Chl a) is the primary photosynthetic pigment in most plants and algae. It is a green pigment that absorbs light energy in the blue and red regions of the visible spectrum.

- Create a table so that records can be inserted.
- Run queries using search criteria to find specific data.
- Create reports including labels from the search criteria.

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Application Software Examples

Photo Editing	Graphics Manipulation	Video Editing
<p>Used to edit digital images to either touch up or to apply various formatting techniques.</p> 	<p>Used to create and edit bitmap and vector graphics.</p> 	<p>Used to edit and format video using various tools and techniques.</p> 
<ul style="list-style-type: none"> • Contrast/Brightness • Use of layers • Filter tools • Lighting effects • Liquify (change features of a face) • Brush tools • Clone/Stamp tool 	<ul style="list-style-type: none"> • Pixels in bitmap images can be changed to produce a different image. • Vector images use: <ul style="list-style-type: none"> • Lines • Curves • Text 	<ul style="list-style-type: none"> • Split and Trim videos • Create split screens • Rearranging order of clips. • Transitions between clips (Fade) • Inserting Audio • Applying filters and using video enhancement techniques

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Application Software Examples

Apps (Phone Applications)

Apps are the software which runs on mobile phones. They usually come with the phone or can be downloaded and updated.



- Games (Angry Birds)
- Video/Music Streaming (YouTube)
- Social Media (Facebook, Twitter, Instagram)
- Communication (Whats App, Viber)
- Camera (Editing images)
- GPS (Satellite navigation)
- Health/ Fitness

Measuring and Control Software

Measuring and control software which are responsible for changing physical conditions in an environment.



Measuring

- Sensors take readings which are processed by the computer or microprocessor.

Control Software

- By comparing sensor readings to a pre-set level the control software will decide on an output (For example to increase or decrease the heat in a green house).

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System Software Examples

Operating Systems



Manages computers functions including hardware devices (input/output). Also provides users with a GUI interface

Device Drivers



Allows hardware devices to run on the computer including printers, sound, graphics and network cards.

System Software



Utilities

Help to manage and maintain computer resources and performance by running specific tasks.



Linkers

Combines object files produced by a compiler into a single program.

Compiler



Translates a program written in a specific language which can be understood by the computer.

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1.1 Hardware and Software

Describe the difference between Hardware and Software?

Key Words: physical components, instructions



Exam Question

Hardware are the **physical components** which make up the computer system. Software is a collection of **instructions** that can be 'run' on a computer. These instructions tell the computer what to do.

Describe the difference between Application and System Software?

Key Words: specific tasks (Word Processor), manage and maintain (Operating System)

Application software are designed to allow users to complete **specific tasks**. For example a **Word Processor** is used to write a letter. System software is used to **manage and maintain** the computer system. An **operating system** such as Windows 10 is used to manage the functions of the computer system.