

# Computing - 3. Fundamentals of Computers Knowledge Organizer

Year 7 – Spring Term 1

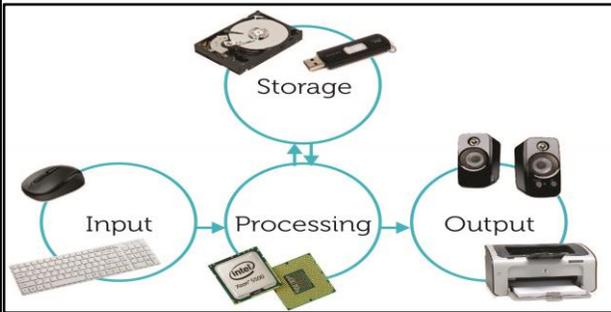


**Computers systems** can be :

**General Purpose systems**- they can do more than one job (use application software for different tasks). Eg Desktop Laptop

**Embedded systems**- they are simple computers programmed for just one task. Eg Home heating systems, microwave ovens, radio clocks, smart watches

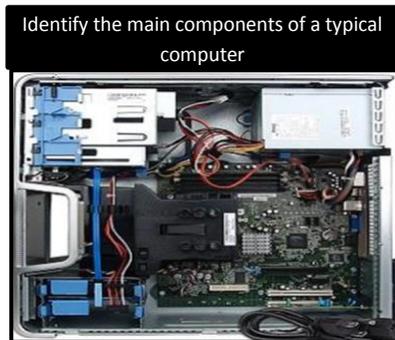
**Communications systems** Mobile phones, sat-nav systems, the Internet



This model also applies to other equipment which uses computer technology, such as mobile phones, games consoles, mp3 players and so on, radio clocks, microwaves.

**Hardware:** refers to any component that has a physical presence and can therefore be touched. Hardware devices can be divided into five types:

1. Data is **input** into the computer via an appropriate input device (e.g. keyboard, mouse, microphone, touch screen etc...)
2. The data is **processed** by the computer (it is modified in some way)
3. The results of the processing are **output** by an appropriate output device (e.g. monitor, speakers, printer etc...)
4. Data may be **stored** for later use, and may be used for other processes. It may also be transmitted to other computer systems via communications devices.



**Peripheral Devices:** These are hardware devices are external to the main body of the computer. They are typically connected by **cables** :USB, Network, Firewire etc.

**Wirelessly:** Bluetooth, wireless network links etc.). **Examples include** keyboards, mice, scanners, printers, external hard-drives etc.

Key Word	Definition
Input (devices)	The part of a computer system used for getting data into the system
Output (devices)	The part of a computer system used for getting data out of the system
Store (devices)	The part of a computer system used for storing data and programs
Process	The part of a computer system used for
Computer System	A computer system is all the components of a computer that enable us to Input, Process, Store and Output data A Computer system is the hardware, software data and processes that work together to produce Output in some form
Hardware	The physical parts of a computer that can be touched and seen
Software	Programs made up of sequences of instructions that tell the hardware what to do
General Purpose Computer Systems	A computer system that is able to do more than one job (use several application software to perform several tasks)
Embedded Computer Systems	A computer system that is simple and that can only perform one task related to the hardware that they are embedded in.
Core System	The part of a computer system made up of the CPU, the RAM and the storage
CPU	A microprocessor called the central processing unit
Storage	Hardware that enables data and programs to be saved permanently and reused later
Peripheral	A hardware device that connects to the core
Software	Programs made up of sequences of instructions that tell the hardware what to do
Operating System	Software / programs that control how the other programs interact with the hardware
Application Systems	Software / programs that enable us to complete a wide variety of tasks
Utility Systems	Software that helps us manage and protect our computer system and data

## Types of Computer System Software

- **Operating System software**
  - Software that controls how apps interact with the hardware



- **Utility Software**
  - help us manage and protect our computer systems

- **Application Software**
  - enables us to complete a wide variety of tasks such as writing letters and finding information



### Reliability of Computer Systems

“Reliability is the probability of a device performing adequately for the period of time intended under the operating conditions encountered.” – NASA

Make sure you have an electronic copy of important digital information in case your system or the system you are saving to crashes and is not available

### Legal Issues

**The Data Protection Act:** This Act specifies the rules about collecting and holding data.

**The Computer Misuse Act** – 1990 Designed to prosecute hackers who gain access to computer systems without consent

**The Copyright, Designs and Patents Act** - 1989 Makes it an offence to copy or distribute other people’s intellectual property without permission

FACT stands for: Federation Against Copyright Theft

Examples of Penalties: 3 months and / £5000 fine

## Environmental Issues

The Waste Electrical and Electronic Equipment Directive (WEEE Directive) is the European Community directive 2012/19/EU on waste electrical and electronic equipment (WEEE) which, together with the RoHS Directive 2002/95/EC, became European Law in February 2003.



Know these 2 pictures



**Health risks** - discarded computer equipment is usually either dumped in landfill sites or recycled, often in poorly managed facilities in developing countries. Some of the hazards include – (**NOT COMPLETE!**):

- Lead in cathode ray tubes and in solder.
- Arsenic in older cathode ray tubes.
- Antimony trioxide as a flame retardant.
- PolySelenium in circuit boards.
- Cadmium in circuit boards and semiconductors.
- Chromium and cobalt in steel.
- Mercury in switches and housing.

### **Alternatives to dumping/recycling:**

**Refurbishing/upgrading** - this can often be a better option than throwing it away, the majority of computer systems disposed of are far from their real end-of-life and could go on to give as much as 6,000 additional hours of use with motherboard, RAM, CPU and hard-drive upgrades.

**Sending to developing countries** - many charities will ship old computer equipment to countries in the developing world where 99% of children leave school without ever having seen or touched a computer in the classroom.

Key Word	Definition
Permission	Giving people the right to do something
Legislation	A set of laws and regulations made by the government to help and protect its citizens
Privacy	Keeping certain information and details away from the public
Data	Facts and other details about a topic
Misuse	Using something incorrectly or illegally. In other words not as it was supposed to be used
Copyright	Laws that protect what we have created from being used by others without permission
Patents	Laws that give us ownership or ideas and designs so that no one else is allowed to use them or make them without our permission