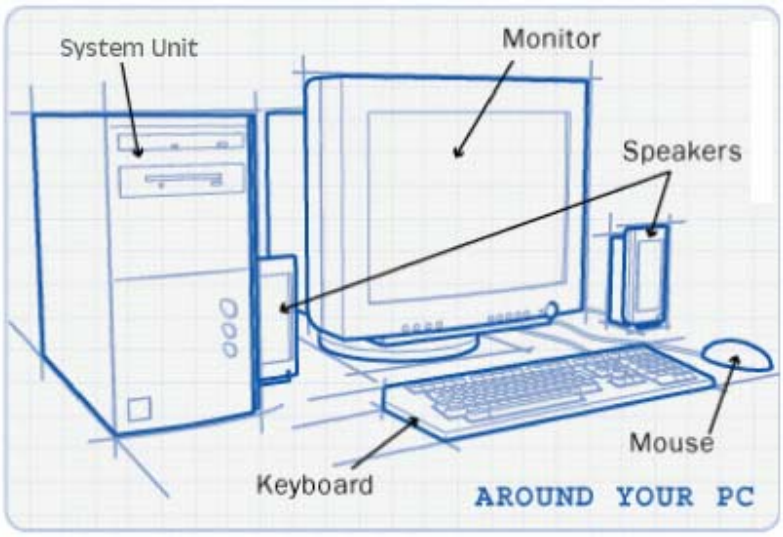
Module 2.7 - Components of Computer Systems

Introduction

A standard computer system usually consists of the following components



Work is displayed on the **monitor**. You enter information and choose options by typing on the **keyboard** or by clicking the **mouse**.

Often other devices, or **peripherals**, can be added to allow the system to carry out different tasks. To allow us to install programs and to keep any documents we create we need some type of **backing storage**.

In this module you will examine a number of computer systems and compare the key components. In this way you will gain an increased understanding of a computer specification, a useful skill when buying a computer system.

Task 1 – Computer Peripherals

Copy the following table into your jotter.

Input	Output	Input & Output	Backing Storage

For each of the following peripherals enter it in one of the columns.

printer	scanner	CD-ROM drive	speakers	modem
microphone	joystick	floppy disk	digital camera	mouse
monitor	keyboard	hard disk	web cam	DVD drive

Add any other devices that you know of.

Task 2 - Computer Systems

In this task we will consider the different options available when purchasing a computer system. To complete the tasks you may need to access the Internet or search for information in computing magazines. In each case we compare the performance of different devices and try to decide which system offers the best performance for the price.

By using the Internet, magazines, and catalogues, choose five computer systems that we will use to compare the various components. Try and select a good variety of systems choosing from desktops, laptops, palmtops, Apple Macs, Intel machines, AMD machines and systems from different manufacturers.

You should save the complete specification of the computer to your computer, perhaps by copying and pasting all the information to a Word document or by saving the webpage to your My Documents folder.

For the five systems you have chosen, copy and complete the following table:

System No.	Manufacturer	Model	Price	Webpage
1				
2				
3				
4				
5				

Task 3 – The Processor

This is the **'brain'** of the computer where all the program instructions are carried out and so is one of the most important things to consider when choosing a computer system. There are different processor types and different processor **speeds**.

The faster the processor clock speed, the more instructions that can be carried out in a given time thus improving system performance although this is not the only measure of processor power.

There are different companies constantly trying to produce faster, cheaper processors.

For 5 different computer systems copy and complete the following table.

System No.	Processor Manufacturer	Processor Type	Processor Speed
1			
2			
3			
4			
5			

Task 4 - Memory

Random Access Memory (**RAM**) is used to store parts of the operating system, any running programs and any open documents. The more RAM installed in your system the more programs and documents can be stored there meaning less data need be accessed from the hard disk. This improves system performance since data can be read faster from RAM than from hard disk.

There are also different types of RAM available, new types of RAM are designed to work extremely fast.

For the 5 computer systems above copy and complete the following table.

System No.	Amount of RAM	Type of RAM
1		
2		
3		
4		
5		

Task 5 - Backing Storage

This category considers the different storage options offered by different computer systems.

Every system will have a hard disk. This is in the system unit and is used to store all the installed programs and all the user's saved documents. Obviously, the larger the hard disk's capacity, the more data can be stored. Capacity is measured in gigabytes, Gb.

For your 5 computer systems, copy and complete the following table.

System No.	Hard Disk Capacity
1	
2	
3	
4	
5	

Other storage options may be available on the system.

For the 5 systems, copy and complete the following checklist.

System No.	Floppy Disk?	CD Drive	Speed	DVD Drive	Speed
1					
2					
3					
4					
5					

Task 6 - Monitor

Since a computer user will spend long periods of time looking at the computer screen it is important that the monitor is of good quality.

Traditional **monitors** are based on **Cathode Ray Tube** (CRT) technology, similar to a conventional television. Now it is becoming increasingly common to have **LCD** or **TFT** screens using the same technology as laptop screens.

For the 5 computer systems you have selected, copy and complete the following table.

System No.	Screen Type	Screen Size
1		
2		
3		
4		
5		

Task 7 - Operating System

An **operating system** (OS) is the most important program on a computer. It is the software that actually allows you to interact with the computer hardware.

The OS market is dominated by various releases of Microsoft Windows. An increasingly popular alternative is Unix or Linux whilst Apple Macintosh's OS is still popular with many people.

For your 5 chosen systems complete the following table.

System No.	Operating System
1	
2	
3	
4	
5	

Task 8 - Sound

Various options exist for sound on a computer system.

Sound **input** to the system can be via a microphone. Voice recognition software is now available which allows you to 'speak' to the computer and either carry out commands, e.g. 'shutdown', or for your words to appear instead of typing.

Sound **output** is dependent upon two devices. Firstly, a **soundcard** is needed which translates digital signals in the computer to sound and then there must be **speakers** to hear the audio output.

For your five computer systems, detail the manufacturer, model and specifications of the audio devices included with the system.

System No.	Soundcard	Speakers
1		
2		
3		
4		
5		

Task 9 - Graphics

Video and **graphics cards** have developed rapidly in recent years mainly due to the demands of modern 3D games. Video cards now include their own video RAM (**VRAM**) and a graphics processor and have huge processing power.

For each computer system, copy and complete the following table.

System No.	Video Card	Video Memory
1		
2		
3		
4		
5		

Task 10 - Additional Hardware

For your selected computer systems now describe any additional hardware items included with the system not previously mentioned, e.g. modem, web cam, optical mouse, cordless keyboard, USB or Firewire ports.

System No.	Additional Hardware
1	
2	
3	
4	
5	

Task 11 - Printers

The 2 most common types of printer are **inkjet** printers and **laser** printers. Inkjets are cheaper to buy and allow low cost colour printing but you have to often buy ink cartridges. Laser printers are more expensive, especially for colour, but running costs are lower.

The most important factor in choosing a printer is its resolution. The higher the resolution, the better quality the printout. Other factors to consider include print speed - measured in pages per minute - for black and white and colour and the cost of replacement cartridges.

Choose five different printers and complete the following table.

Manufacturer & Model	Resolution	B&W speed (ppm)	Colour speed (ppm)	Cost	Replacement cartridges cost (B&W)	Replacement cartridges cost (Colour)

Task 12 - Scanner / Digital Camera

Both scanners and digital cameras allow you to get images into your computer. For a scanner the most important factor to consider is the quality of the image it scans. This is the **resolution** and is measured in **dots per inch** (dpi).

Search for information about five scanners. Copy and complete the following table.

Manufacturer	Model	Cost	Max. Resolution	Bundled Software

Similarly, the **resolution** of pictures taken by a digital camera is the major factor to consider, although the **capacity** of the camera, i.e. the number of images the camera can store, is also of importance. Additional factors to consider may be zoom, flash etc.

Search for information about five digital cameras. Copy and complete the following table.

Manufacturer	Model	Cost	Resolution	Capacity (Mb or no. of images)	Additional Features

Task 13 - Software

Almost all modern computer systems come bundled with a number of software programs. The main classes of software are:

- Text handling e.g. word processing software
- Number handling e.g. Spreadsheet software
- Information handling e.g. Database software
- Graphics handling e.g. Painting and drawing software
- Communication software e.g. Email and web browsing software
- Development software e.g. Programming languages
- Entertainment software e.g. Games or multimedia software
- Education software e.g. Learning or study programs

For your 5 chosen systems state the name and type of all software packages supplied with the computer, e.g. Lotus 1-2-3 - spreadsheet program.

System No.	Bundled Software
1	
2	
3	
4	
5	

Task 14 - Producing a Computer Specification – Module Assessment

The letter below was written by a Mr G Byrne, an art teacher, to a firm that sells hardware and software to meet customers requirements.

I am an art teacher in St Henrik's Secondary school. As well as my teaching duties I often sell pieces of my artwork and, about once a year, stage an exhibition.

I am considering investing in a computer to help me in a number of areas. Firstly I would use a computer for schoolwork. I plan to use the computer for preparing lesson plans, overheads, handouts etc. If I could record my students grades it would also be a great benefit.

My main reason for purchasing a computer is to help support my artwork. I would like to produce an online portfolio, i.e. I would like to make a simple website with images of my paintings. Then people must be able to contact me using email. A website design company would be too expensive and I would like to learn how to make my website, then I can easily update the site as I paint new works. Currently I have photographs of my best paintings and I have to send copies of these to prospective customers.

For my annual exhibition I currently pay a graphic designer to design posters, flyers and complimentary cards. It would significantly cut costs if I could design them myself on the computer and then simply pay for a professional printer. I am told these files, including high resolution scans take up a great deal of space on a disk – substantially more than a floppy disk can hold – please advise.

Finally, managing the financial aspects of my business could, I hope, be helped by the use of the computer. I have to declare all earnings to the taxman and like general help in budgeting, expenses, etc.

I look forward to hearing from you.

Complete the following in a Microsoft Word document.

1 - Analysis

Write a list of the main tasks that Mr Byrne needs his computer to carry out.

E.g. Mr Byrne needs to prepare lesson plans and handouts.

2 - Requirements

Write a list of any hardware or software requirements Mr Byrne will need to solve each of these tasks.

E.g. Mr Byrne will need a word processing package and a printer.

3 - Specification

Write a list giving possible options for each of these requirements.

E.g. Different word processing packages include MS Word, MS Works, Lotus Word Pro and Apple Works.

4 – Recommendation

Write a list giving your recommendation for each task, describe why you chose 1 option over the others.

E.g. I would recommend MS Works because it includes a word processor, spreadsheet and database and comes with wizards to help guide you through the process of producing documents. Ms Word is perhaps a more powerful word processor but Mr Byrne does not need the power of MS Word and it is more expensive. Apple Works is for the Apple Mac platform and our system is a PC, Lotus Word Pro is not as commonly used as MS Works so it would be harder to share files between computers.

5 – Costs

Write a detailed costing for a computer system and all software and hardware Mr Byrne would require.

MS Works Suite 2002: £89.99

Print and submit your word-processed report to your teacher.

You will be awarded up to 5 marks for each of the five questions. The grade you receive will be the module grade for this module.

Homework Exercise 1

1. Your friend has a new computer but he has never used a computer before.

   (a) Describe what each item of a basic computer system does. (4)

   (b) Describe why the computer has an operating system. (2)

   (c) Describe four common types of program available to him. (4)

   (d) Describe two things will need to connect to the Internet. (2)

   (e) List the running costs for his computer, i.e. what will he need to keep buying or paying for. (2)

   (e) Explain what computer viruses are. (1)

   Total (15)

A+	15, 14, 13	A-	12, 11	B+	10	B-	9	C+		C-	8	N	7

Homework Exercise 2

1. The following is an advert for a new, cutting-edge computer system. Copy and complete the diagram by filling in names and appropriate values.

2. Given £1000 to spend on a computer system you must decide between a laptop and a desktop system.

   (a) List three components that would be different between the laptop and the desktop. (3)

   (b) Give one advantage of buying the laptop. (1)

   (c) Give one disadvantage of buying the laptop. (1)

   Total (10)

A+	10,9	A-	8,7	B+		B-	6	C+		C-	5	N	

Homework Exercise 3

You may find help in answering these questions by visiting a site such as www.webopedia.com.

1. Describe the role of the following components of a computer system.

   (a) Processor (1)

   (b) RAM (1)

   (c) Backing storage (1)

2. Describe the difference between CD-ROM, CD-R and CD-RW. (1)

3. What is the meaning of the following:

   (a) CRT (1)

   (b) LCD (1)

   (c) TFT (1)

4. Name 3 different operating systems. (3)

5. (a) What is the resolution of a graphic? (1)

   (b) How do we measure the resolution of a graphic? (1)

6. (a) What does USB stand for? (1)

   (b) What is USB used for? (1)

Total (14)

A+	12,11	A-	10, 9	B+	8	B-		C+	7	C-	6	N	

Homework Exercise 4 – Software

1. The following are major software companies. For each one name two programs that they produce, describe what each program is for and find the price of each one.

   (a) Macromedia (2)

   (b) Adobe (2)

   (c) Electronic Arts (2)

   (d) Eidos (2)

   (e) Lotus (2)

   Total (15)

A+	10,9	A-	8,7	B+		B-	6	C+		C-	5	N	