Computer Specifications (PC)

What is the Specification?
The specification or ‘spec’ is a list of the key components that make up the computer. It is provided by retailers to help buyers decide which PC, and which combination of features, they need. When buying a PC, it is important to start by deciding what it is you want the PC to do. This then informs what specification you actually need.

When reviewing a computer specification, the most important components to take account of are the processor, the amount of RAM and the size of the hard drive as these are central to the overall capability of the system. If it is planned to use specialised programs for students with special needs (e.g., scan/read software), it is advisable to purchase a suitable specification computer to meet the system requirements for these programs.

Understanding a Specification

<table>
<thead>
<tr>
<th>PC Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intel or AMD Processor Model No</td>
</tr>
<tr>
<td>• 1GB SDRAM</td>
</tr>
<tr>
<td>• 80GB Hard Drive</td>
</tr>
<tr>
<td>• 48X Max CD/DVD Drive</td>
</tr>
<tr>
<td>• 17” Flat Screen Colour Monitor</td>
</tr>
<tr>
<td>• Graphics Card</td>
</tr>
<tr>
<td>• Microsoft Windows XP</td>
</tr>
</tbody>
</table>

Processor Information
The processor is the ‘brain’ of the computer and controls most of the work done.

Memory Information
RAM (Random Access Memory) is the working memory the computer has available to do work.

Hard Drive Information
The hard drive is a central storage area for the programs being run and the documents or assets created.

Other Information
Includes information about the sound and graphics capability of the computer, as well as details of the monitor, operating system and software that come with the computer.

Processors
Two companies - Intel Inc. and AMD Inc. - manufacture most of today’s PC processors and both offer a range that balances price and performance. Processors are generally defined by their speed - in megahertz (MHz) or in gigahertz (GHz) - and this relates to the number of operations they can perform per second. The higher the value, the faster the PC will perform and the more expensive it generally is. The latest dual core processors have two processors on a single chip and operate more efficiently at lower speeds e.g. Intel’s Pentium D and AMD’s Athlon X2. More recent more powerful processors use a 64 Bit architecture, rather than the previous 32 Bit models.

<table>
<thead>
<tr>
<th>Entry-level processors</th>
<th>Mid-range processors</th>
<th>High-end processors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Office applications</td>
<td>• Educational software</td>
<td>• Processor intensive multimedia creation applications, e.g. 3D graphics and video editing</td>
</tr>
<tr>
<td>• Internet browsing</td>
<td>• Office applications</td>
<td>• Office applications</td>
</tr>
<tr>
<td>• Basic graphics programs</td>
<td>• General multimedia applications</td>
<td>• Internet browsing</td>
</tr>
<tr>
<td>• Home computing</td>
<td>• Internet browsing</td>
<td></td>
</tr>
</tbody>
</table>

© National Centre for Technology in Education June 2007
**PROCESSOR TYPES**
- Intel Celeron D
- AMD Sempron
- Intel Pentium 4
- AMD Athlon (32 Bit)
- AMD Opteron
- Xeon
- AMD Athlon 64 X2

**Memory (RAM)**
The main working memory in a computer is called random access memory or RAM. The processor uses this memory to run programs. RAM is measured in megabytes (MB). Most modern computers use DDR 2 RAM.

- A minimum of 1024MB (1GB) of RAM is recommended for general purpose PCs.
- 2048MB (2GB) of RAM is recommended for PCs running multimedia applications, i.e., those on which digital music, digital video or high-end graphics are being created/edited.

**Storage – The Hard Drive**
The hard drive is the computer’s primary storage area. It stores the applications and programs that run on the PC, as well as any work created by users. From a school’s perspective, the capacity of the hard drive, measured in gigabytes (GB), is a key criterion and should be given due consideration when reviewing PC specifications.

- A hard drive capacity of at least 80GB is recommended for general purpose PCs.
- A hard drive capacity of 200GB or more is recommended if working with multimedia applications where large graphics and digital audio/video files are being created and stored.

**Other Specifications**

**Monitors**
The older CRTs have been largely replaced by TFT flat-screens. A 15” TFT has the same viewing area as the older 17” CRT.

- Average entry-level PCs usually come with a 15” flat-screen and this is adequate for most general purpose applications.
- Larger 17” flat-screens are available and may be appropriate if video editing and advanced graphics work is being carried out.
- Teachers of students with special needs may want to consider using larger monitors with their students.

**CD / DVD Drives**
CD R/W drives are standard on PCs and allow the information on a compact disc (either data or audio) to be read and written to by the PC. It is defined by its speed (i.e., 48x or 48 speed). DVD drives can read both CDs and DVDs. 48x DVD-ROM/CD_RW drives are standard on entry level computers. These allow you to copy to blank CDs. 52x DVD-RWs are standard on higher performance computers. Educational software is being developed in both DVD and CD formats, but a DVD can hold over 25 times more data than a CD.

**Graphics and Sound Cards**
These cards are installed inside a PC and are responsible for determining the quality of the audio and visuals (graphics and video) output by the computer. They hold their own memory (in MB), which is why they add to a computer’s capability.

- A integrated graphics card with 256MB of memory is recommended for general purpose PCs.
- Computers running high-end applications generally require a separate PCI 128MB graphics card.
• A sound card generally comes as standard in most PCs purchased today. If students intend to work extensively with digital music, the school should consider getting a high-end sound card as this will create greater depth, complexity and realism of sound.

Speakers and Headphones
Most computers come with either built-in or external speakers. Schools may also consider buying headphones to control sound levels within a classroom or computer room. Cheap ‘headphone splitters’ can also be purchased — these enable two sets of headphones to be used per computer.

Network Interface Card (NIC)
It is recommended that all PCs be purchased with a suitable network interface card (NIC). A network card allows a computer to be connected to a network. A 10/100/1000 Mbps (Mega bits per second) card is the standard network card today. Few school networks currently operate at speeds higher than 100Mbps.

Operating Systems (OS)
PCs are generally purchased with an operating system pre-installed. It is worth checking that your existing software will still work with the operating system of any new systems being purchased. It may be possible to choose a particular operating system and, if so, this may help standardise new machines with existing school PCs. Microsoft introduced their Vista OS in January 2007. Windows XP however will probably remain the most commonly used OS till approx mid-2008. Windows XP Home is at least €100 cheaper than XP Professional but it is not suitable for school networks. Vista Home Premium replaces XP Home and Vista Business replaces XP Professional.

Purchasing Considerations
Consider the following points when purchasing PCs
• What is the intended use of the PC and will the chosen specification fulfil these aims?
• Is the PC compatible with existing computer equipment and software?
• Is the technical support service satisfactory?
• A minimum 3 year warranty including next business day (NBD) onsite, including full parts and labour is recommended

Related Web Sites
How stuff works
http://computer.howstuffworks.com/pc.htm
In this article, PCs in the general sense and all the different parts that go into them are explained. You will learn about the various components and how they work together in a basic operating session. You'll also find out what the future may hold for these machines.

Note: While the advice sheets aim to act as a guide, the inclusion of any products and company names does not imply approval by the NCTE, nor does the exclusion imply the reverse. The NCTE does not accept responsibility for any opinions, advice or recommendations on external web sites linked to the NCTE site.

This Advice Sheet and other relevant information are available at:
www.ncte.ie/ICTAdviceSupport/AdviceSheets