Computer Basic: Get the Computer that’s right for you!

**Overview:** Learn how to read computer advertising and understand what’s most important about buying a computer. Practice with the mouse as well.

**Student Skill Level:** Basic

**Requirements:** None

**Length:** 3 hours (with a 10 minute break)

**Objectives:**
- The student will be able to:
  - Decipher a computer advertisement by:
    - Naming the three major types of computer
    - Naming hardware elements of a personal computer
    - Understand memory space and processing speeds and how they affect computer speed (and price)
    - Define the term Operating System (software)
      - Why is it that important?
    - Learn the best way to hold the mouse
    - Practice using the mouse
Hardware Type

There are now three major types of hardware: PCs (or desktops), Laptops/Notebooks, and Tablets. Keep in mind the following:

**PCs** are the sturdiest, and generally, the most inexpensive to purchase

**Laptops** are very popular now, and price depends on more than just hardware and software, it depends on size, too. Laptops are measured just like TVs: on the diagonal.

**Tablets** are fully-functional computers, minus USB ports (some), hard drives, and optical drives.

Typical Computer Ad (See [www.tigerdirect.com](http://www.tigerdirect.com))

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**PCs**

**HP EliteDesk 705 G3 SFF Desktop PC - AMD Pro A8-9600 Quad-Core 3.1GHz Processor, 8GB DDR4 SDRAM, 500GB HDD, AMD Radeon R7 Graphics, 6x USB 3.1 Gen 1, DisplayPort, Windows 10 Pro 64-bit - 1UF85U8#ABA**

Item #: 4192209 | Model #: 1UF85U8#ABA

Price: **$429.99**

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**HP 260 G2 Mini PC Desktop - Intel Core i5-6200U 2.3GHz, 8GB DDR4, 256GB SSD, Integrated Graphics, 4x USB 3.0, Win 10 Pro 64-bit 3-Yrs Warranty - 2SN28UT#ABA**

Item #: 40711681 | Model #: 2SN28UT#ABA

Price: **$579.99**

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**Lenovo ThinkCentre M900 SFF Desktop PC - Intel Core i5-6500 3.2GHz, 4GB DDR4, 500GB HDD, HD Graphics 530, DVDWR, 6x USB 3.0, GigE, Win 7 Pro 64-bit/Win 10 Pro License - 10FH000KUS**

Item #: 13725926 | Model #: 10FH000KUS

List Price: $649.99
Instant Savings: -$470.00 (43%)
Price: **$629.99**

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**HP Z240 Tower Workstation - Intel Core i7-6700 3.4GHz Quad-Core, 16GB DDR4 SDRAM, 256GB SSD, HD Graphics 530, DVDWR, GigE, 2x DisplayPort, 1x DVI-I, Preinstalled Win 7 Pro 64-bit - L9K20UT#ABA**

Item #: 13770728 | Model #: L9K20UT#ABA

List Price: $639.99
Instant Savings: -$420.00 (32%)
Price: **$879.99**
NOTE: If you understand everything on this page, congratulations! You have successfully completed the class! If not, stick around. We can learn together!
Hardware: Monitor

Liquid Crystal Display (LCD or flat panel) – narrower and more expensive, they also provide a sharper picture and take up less space on a desk.

Flat panels are the only type of monitor you may purchase for a new computer, and more computers are now **touch screens**, which means you must purchase the monitor.

**Touch screens** use any combination of glass or other surfaces to track finger or stylus movement across the screen. These are the most intuitive to use, as there’s no mouse. TFT is the newer technology of Thin Film Transfer. It improves contrast on the display.

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Keyboard

Full-size keyboard:

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Touch screen keyboard:

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Mouse – It’s unique!

A pointer device that is both: **Hardware** – the piece you touch

**Software** – the indicator on the screen

As you move the mouse, remember to always **focus on the computer screen**. Using the mouse takes a bit of hand-eye coordination and a lot of practice! We will practice later in class. **Note: touch screens have no mouse. Your finger is the pointer.**

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**Computer Speed: Central Processing Unit (CPU) and RAM**

**Speed:**

It is a computer chip that funnels electricity through silicon circuits, carrying out command sequences. To complete this, CPUs need to **fetch** the instructions, **decode** them (break them up between parts of the chip that are needed to complete the instructions), **execute** the instructions (electricity runs through complete circuits in the chip), and **writeback** the results of the execution (to make sure the computer engineer knows the sequence completed successfully).

The speed of the chip is measured by how fast the electricity can finish its path through the chip and thus fulfill a single sequence of stored instructions.

Computer engineers make the chip work to the **tick of an internal clock**, and the processor generally performs **one circuit** (fetch/decode/execute/writeback) on **every tick**. This “clock speed” helps determine the speed of the computer and it’s measured in **hertz**.

Today all processors are measured in **gigahertz (GHz)**. “One gigahertz” means the processor’s “clock ticks” **one billion times in one second** – one billion calculations (circuits) per second. Currently, AMD has one of the fastest Central Processing Units at over 4GHz. That means it can perform 4,00,00,000 (that’s **billion**) calculations per second.

**Cores:**

Processors may be **multicore** (two or more processing units integrated into one chip) so they run faster. For example, Intel produces a **quad core processor** (essentially 4 processors in one chip). Computer engineers are constantly working to improve a processor’s speed; by using multiple processors it’s possible to achieve **some level of parallel processing** (using parts of each processor to perform a single task, thereby making the computer faster).

The faster the processor (or the more cores it has), the less likely the computer will “freeze” from operational overload. The faster the processor, the more money you will spend on a computer – a single chip can cost as much as a low-end consumer computer ($500 or more).

**The CPU is advertised as the first specification in a computer advertisement.** “Core i7” “i3”
Memory: Two types built into the Computer

Temporary Memory:
RAM – Random Access Memory is also located inside the computer. It is integrated circuitry that plugs into the motherboard and allows computer users to access stored data quickly and efficiently – as long as there’s constant electricity. This data is permanently lost if a computer shuts down unexpectedly. The more RAM a computer has, the more room the user has to “play.” More RAM means the computer can store more information for quick access as the user operates the computer; the computer responds faster. RAM is advertised as the second item in the specifications. “12GB.” “6GB.”

Permanent Memory:
Hard Drive (C: drive, Hard Disk or Local Disk) – located in the computer itself. It is made of platters (a hard drive may have from 1 to 6 platters inside its sealed compartment). This is a picture of the hard drive that is located inside the tower. You should never open the sealed case of the hard drive (you will ruin the data on the platters)

Memory: Portable Memory

Flash drives (a.k.a. USB, thumb, jump drive, removable disk, or memory stick) plug into any available USB (Universal Serial Bus) port on the computer. They range in size from 16 to 512 Gb (16Gb costs $15 or less. 512Gb costs about $400).

Flash drives are the best way to store anything you would normally save on the computer: text documents, music, pictures, or videos/movies. They will store as much data as they have space for and are easily used – just plug them into a USB port on any computer. When they are plugged in, there is electricity that runs through the port to power the circuitry inside the drive. They are fairly tough, as well, meaning you can store them virtually anywhere and your data is safe.

Most computers come equipped with 4 to 8 built-in USB ports. Two of those ports are usually in the front of the computer for easy access. Even tablets are coming with USB ports on them, and they already have flash memory inside (replacing the bulkier hard drive for onboard storage).

Optical Drives
Computers MAY come with an optical drive to read and write CDs and DVDs
R/W – Read/Write – reading means “play back” and writing means “saving” (burning; this is usually only done for music, if there’s a CD player in a car)
One drive does everything: CD/DVDRW
You may also find BluRay drives for sale. If you’d like one in your computer, it’s recommended you purchase a computer with one built-in. BluRay disks are also writeable.
Memory Space – What does it mean to you?

Memory Space Measurements:

<table>
<thead>
<tr>
<th>Name</th>
<th>Abbreviation</th>
<th>Size</th>
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</thead>
<tbody>
<tr>
<td>Bit</td>
<td>b</td>
<td>1 bit (on or off, 1 or 0, electricity or no electricity – it’s the lowest unit of measure – everything else is based on this)</td>
</tr>
<tr>
<td>Byte</td>
<td>B or b</td>
<td>8 bits – one typed letter (&quot;F&quot;)</td>
</tr>
<tr>
<td>Kilobyte</td>
<td>Kb</td>
<td>1000 bytes – about 1/2 page of text</td>
</tr>
<tr>
<td>Megabyte</td>
<td>Mb</td>
<td>1000 kilobytes – 1 Mb is about 500 pages (about 2 books), 4Mb is about one digital photo, or 1 song</td>
</tr>
<tr>
<td>Gigabyte</td>
<td>Gb</td>
<td>1000 megabytes – 1 Gb is about 250 photos, or 2,000 ebooks. 5Gb is about one DVD (Hollywood movie with extra features) A Blu-ray is about 27Gb.</td>
</tr>
<tr>
<td>Terabyte</td>
<td>Tb</td>
<td>1000 gigabytes – about 225,000 digital photos or about 450 DVD movies</td>
</tr>
</tbody>
</table>


Motherboard – the circuitry that ties everything together

The motherboard is the main printed circuit board in a computer; it carries the system buses (the circuitry that allows all the hardware devices in the computer to talk to each other).

Equipped with connections for:
All processors (CPU)
Memory modules (RAM)
Plug-in Cards (Sound and Video)
Any peripheral devices (USB ports)
All power supply cables (electricity)

Memory Space and Processing Speed In a Nutshell

There are 3 major things to keep in mind when looking at computers:
1. Processing speed/number of cores
2. RAM size
3. Hard Disk/Onboard storage size, HDD vs. SSD

IN GENERAL:
The larger the RAM and faster the processor, the more money the computer will cost.

The larger the laptop or tablet, the more money it will cost. (“Larger” here refers to physical size).

Solid State Drives cost more than Hard Disk Drives
The Operating System (Software)

Operating Systems:
Controls the overall activity of your computer – it dictates what you see on the screen
Manages your hardware ("plug and play")
Runs your software and controls the proper sequence of activity that takes place in the processor
Arranges your information on the hard drive and other storage areas; Runs multiple programs and shares information between programs
Represents programs, commands, and options visually

Three Major OS’s: Windows, Apple, Android

Apple controls all the hardware and software for its computers. This means that Apples are always more expensive than Windows or Androids.

Apple products are preferred by anyone in graphic design, fashion, music, or any other "art" major. However, because they are so expensive, consumers and businesses alike tend to favor Windows. This pattern holds steady from the 1980s through the 90s.

In 2001, Apple came out with the iPod for digital music. This really put Apple out in the mass market again.

Windows products are really "just" software. Bill Gates allowed other companies in the 1980s to make the hardware to fit his software. IBM is the most iconic. Now, you have multiple companies that “fit” Windows computers. This means competition. Competition means that the price drops, and more people adopt that computer. This is why Windows is still about 95% of the computer market.

Windows, along with all other software companies, updates its system.

For many, many years, all computers were “stand alone,” meaning that you used one computer and that was it.

Then: BOOM!!!!!
THE INTERNET IS ONLINE!!
MASS HYSTERIA ENSUES

Windows went through many “iterations.” Generations.

1990s: Windows 3.1 and 3.2


2009 Windows 7 – good system. Sleek, runs in background. Windows 7 is the last of the “stand alone” operating systems.

2012 Windows 8 came out. BAD!!!

2015 – Windows 10 First system that Microsoft offers FOR FREE.
Android is the latest player in the computer game, and its focus is the mobile market. It first appeared on the market in 2008, fully 23 years after the Mac. It’s still number 1 in the mobile market, followed closely by Apple (they trade spots a lot). Windows was late to the game, and so are still a distant third. LOGOS:

**You may use a different Operating System for your phone or tablet. Apple OS and Android are the two systems most popular in the mobile market. They each have their own learning curves!**

Windows programs look alike! This is an important concept and very encouraging to new users. Please know that once you get the feel for ONE Windows program you will have the overall sense of EVERY Windows program. This includes:

- **Boxes** called “Windows” that open on screen to present options to you
- **Title bar**: minimize, resize, and close buttons
- **Menus** that show commands you can use

Requires a **mouse or touch screen** (but there are many **keyboard shortcuts** available in each program)
Windows Desktop

When you begin working on any library computer, this **desktop** is your base. It really is just like an actual desktop that you organize. **Icons** on the desktop are pictorial representations of items you can use. For example:

**Computer** allows you to browse and search your entire computer system.

**File Explorer** allows you to find files stored on your computer, flash drive, or cloud storage.

**Recycle bin** stores all the files you choose to delete and allows you to recover them later.

**Program Icons** (or **software applications**) help you get your work done. Some popular examples include:

Web browsers:

- Internet Explorer
- Mozilla Firefox
- Google Chrome
- Safari (Apple)

Office applications:

- Microsoft Word
- Microsoft Excel
- Microsoft PowerPoint
- Microsoft Publisher
Mouse Skills Require Practice!

- **Left Click** (Used most often)
  - Used to select something in a program
- **Double-click** (on left button)
  - Used to start programs.
- **Right Click**
  - Context sensitive as it generally brings up submenus
- **Scroll Wheel**
  - Used to move a file up and down in a window (when it is too big for the window) so you may see everything
- Different options become available depending on where the mouse is when you click. Remember: **Mouse skills require practice!**

A touch pad:

A button mouse:
Mouse Tutorials

There are many different tutorials on the Internet, and sometimes getting to them can be a trick in itself! Follow these instructions to get to one particular tutorial:

Open Chrome (double click the icon)

Click once in the Address bar (the letters turn blue)

Type pbclibrary.com/mousing in the address bar

Press the Enter key on the keyboard

Click on the mousercise link in the middle of the page

Begin the self-paced tutorial! Good luck and have fun!

Hand Position on Mouse

To hold the mouse, rest the palm of your right hand on the mouse so your index finger is positioned over the left mouse button. Grasp the mouse lightly using your thumb and ring finger to control the movement of the mouse on the surface or mouse pad.

http://www.kckps.k12.ks.us/courses/images/position.gif
References


Resources

**These items are available in the NIOGA Library System!**

**Contact your local library for assistance!**

<table>
<thead>
<tr>
<th>Call Number</th>
<th>Author</th>
<th>Title</th>
<th>Date</th>
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<tr>
<td>004.0846 ARNO</td>
<td>Arnold, A</td>
<td>Computing with Windows® 7 for the older and wiser : get up and running on your home PC</td>
<td>2010</td>
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<tr>
<td>004.071 SENI</td>
<td>Gorzka, M</td>
<td>A Senior’s Guide to Using a Computer (DVD)</td>
<td>2008</td>
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<tr>
<td>004 LIND</td>
<td>Lindros, K</td>
<td>PC basics with Windows 7 and Office 2010</td>
<td>2011</td>
</tr>
<tr>
<td>005.446 MCFE</td>
<td>McFedries, P</td>
<td>Teach yourself visually Windows 10 : the fast and easy way to learn</td>
<td>2015</td>
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