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## BUYING A COMPUTER

### Sources

Circulars in the (Sunday) papers  
J&R Computer World (downtown)  
PC Richards, etc.

<http://www.dell.com>

<http://www.gateway.com>

<http://www.hp.com>

<http://www.e4me.com/>

<http://www.froogle.com>

### Operating System (“OS”)

The operating system is the basic software that turns on the computer, runs all the hardware and software, and controls all other functions of the computer. When you buy a new computer, your operating system will automatically be installed at the factory.

### Windows XP

New computers should come with the **Windows XP** operating system. There are a few different version of this operating system, but Windows XP Home Edition should be adequate for the home user.

### Consumer Reports: Problems by Brand

See the June/September issues of CR (available on Stack 11) for the comparison of repairs & serious problems by computer brand. Apple computers have the best track record yearly on breakdowns. Among PC brands Dell desktops and laptops have an 18% repair/problem rate of



computers sold (good track record) and Gateway and Compaq desktops and laptops are the most problematic with repair/problem rate of over 20% of computers sold (bad track record).

Sobering fact: CR also reports that 2% of computers are completely inoperable upon arrival.

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## DESKTOP VS. LAPTOP

### Desktop

- Takes up space, ugly cables, etc.
- Can be attached to a big wide monitor.
- Uses a standard, user-friendly keyboard & mouse.
- Has more USB ports – can add lots & lots of peripherals.
- Easy to make upgrades.
- Easier to fix if something breaks.

### Laptop

- There are now more laptops than desktops sold in the United States.
- Takes up little space. Great for New York apartments.
- Can bring to the Library, travel with it out to country, take overseas, etc.
- “Only way to take full advantage of the growing availability of high-speed wireless Internet access at airports, schools, hotels, restaurants, and coffee shops”—Consumer Reports.
- Requires a battery, which will last between 2-4 hours. Battery takes time to recharge. Battery replacement: expensive.
- Laptop monitor much smaller than a desktop monitor. May not be great for those with vision problems.

- Keyboard much harder to use than a desktop monitor, especially if you grew up using a typewriter.
- At home you don't have to use the little laptop keyboard/mouse. You can connect a large external keyboard, full-size mouse, and even large monitor to a laptop.
- Difficult/impossible to make hardware upgrades on your own.
- Extremely expensive to repair anything (esp. monitor), and touchpad & keys seem to wear out quickly.

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## PROCESSORS (=BRAIN OF COMPUTER)

The **processor** (“chip”) is always called the brain of the computer, but maybe it’s better to think of it like a car engine. The faster the processor you choose, the faster your computers will run. Processor speed is especially important for fast Internet connections.

Processor speed is measured in GHz, and determines *how quickly information will be crunched in your computer*. Processors (“chips”) are marketed using cute little names that you’ve probably run across in the newspaper and such.

Measured in:           **GHz (pronounced GIGAHERTZ)**  
Common range:        1.6-3.6 GHz

1.6 = slow computer (like a Dodge Duster)  
3.6 = fast computer (like a Porsche Boxter)

Examples:

- Intel Celeron (so-so)
- Intel Pentium 4 (very good)
- AMD’s Athlon (so-so)
- AMD’s Duron (much better)

In tests, the Pentium 4 always wins out in speed.

According to Consumer Reports the average user needs no more than a 2.4 GHz processor. It’s not necessary to pay for more.

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## RAM

The RAM (random access memory) is the memory the computer is going to use while it's actually in operation. It's pronounced "ram" like the animal in the Chinese zodiac and measured in MB (pronounced "megabytes"). **More RAM makes your programs run faster.** Also called system memory, it can have lots of types like EDO, SDRAM, DDR, or Rambus DRAM. Additional memory has become inexpensive.

Measured in:           **MB (pronounced MEGABYTES)**  
Common range:       **MAKE SURE at least 256**

128 = very slow computer (like a bus in Midtown)

512 = fast computer (like the A train on a good day)

There's also Video RAM. This is for the video & video game people to worry about.

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## HARD DRIVE (=STORAGE UNIT)

The hard drive (sometimes written “HD”) is the actual storage unit that’s going to hold all those pictures, documents, programs, etc. on your computer.

If you’re *only* going to check e-mail and browse the Internet (and this is unlikely), you may not need a big hard drive.

If you’re going to use your computer for absolutely anything else, *especially* for digital photos and/or video, buy the biggest hard drive that you can afford.

Measured in:           **GB (pronounced “GIG” or  
                                  “GIGAHERTZ”)**

Common range:       40-300 GB

40 GB     = small hard drive (like a studio apartment)

300 GB    = big hard drive (like a 4 bedroom, 2 bath)

It’s possible to install as second hard drive on your computer or buy a peripheral hard drive that you’ll plug into your computer via a USB port.

### USB Memory Drive

Additional, there are memory keys that serve as tiny hard drives that are small enough to attach to a key chain. These can replace a floppy disc and carry a vast amount of data.

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## DRIVES

### Floppy disc

These used to be standard on every Mac & PC, but they're rapidly disappearing on Macs & PC laptops, and even some PC desktops. A floppy disc is still a simple way to transfer around MS Word documents and such, but they'll barely hold a single digital photo.

### CD-ROM

A CD-ROM drive is standard now for desktops and most for laptops. It pops open just like a normal CD player, you insert the music or data CD, and it should automatically run. CD-ROM is "read only" meaning you can get view data on it, or take data off of it, but not place data on to it.

Note that CD-ROM drives have speeds: 16x (meaning 16 times a second)—slow, 32x, 48x, 72x—fast.  
Recommended: at least 40x.

### CD-RW

The CD-RW drive is a little more complex than the CD-ROM drive in that it allows the user to "burn" documents, digital photos, music, or other data to a standard CD to share with other computer users. This is a wonderful way to replace using floppy discs as a CD holds so much more data. You can generally get many, many documents and photos on a CD-RW or about 80 minutes of music.



## **DVD drive**

The DVD drive is just like a DVD player that attaches to your television. Insert DVD, watch DVD on your computer monitor. Sometimes this DVD drive is the same thing as your CD-ROM drive and/or your CD-RW drive. This is handy not only for playing DVDs, but some books at the Library are being issued with DVD to accompany the text. Note that you need some separate software to view movies and such with your DVD drive, but this should already be installed on your new computer or can be easily installed if it's not there.

## **DVD-RW**

See CD-RW above. A DVD-RW disc will play in most (but not all) DVD players that connect to your television.

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## MONITORS

Monitors basically come in two types:

- CRT (big box) monitors
- LCD flat-screen monitors

### **Box Monitors (CRT)**

Box monitors are extremely inexpensive and often come standard (free) with a computer. They start with about a 13" screen, which should be good enough, but can get much larger. The standard now is 17"-19". Essential problem in New York City: a 13" monitor is at least a foot deep. This takes up MUCH desk space and gives off a fair amount of heat. CRT box monitors are very heavy, at 30-50 pounds.

### **LCD Flat-Screen Monitors (AKA Flat-Panel Monitor)**

The LCD flat-screen monitors have surpassed the CRT box monitor in sales. They've also come down in price greatly in the last few years. You can purchase a lovely 17" flat-screen for just over \$200. Up in the \$500 you can purchase a dual PC monitor/television monitor to really save space. It's very easy to move around an LCD monitor as they weigh 15 pounds or less.

Monitors come with a warranty. Check the length of the warranty, especially for the LCD monitor.

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## PERIPHERALS

### Keyboard

This will come with your new computer at no charge. You can buy a fancier one for \$20 if you don't like the standard keyboard.

### Mouse

This will come with your new computer. You can buy a fancier one. I especially recommend an inexpensive optical mouse, which runs on a beam of light directed at your desk. It doesn't get dirty or break as quickly as a standard roller-ball mouse. This kind of mouse may or may not come standard with your computer.

### Speakers

Often come standard with a new computer. Music enthusiasts who plan on using the computer for playing digital music files or music CDs can invest in a high-quality speaker system.

### Printers

Printers generally come in two models: the ink jet and the laser printer. Printers come with installation software, but Windows XP machines often recognize the printer automatically and no software installation is required.

**Ink jet printers** are relatively inexpensive, starting at \$50, but the replacement cartridges are stunningly expensive, costing up to \$40 per cartridge. Ink jet cartridges produce far fewer pages than a laser

printer, meaning much more frequent cartridge replacement. Recommended brand: HP. Problem brands: Epson & Cannon. Ink jet print quality: slightly smudgy and noticeably lower than laser printer quality.

**Laser printers** are more expensive than ink jet printers at the outset, starting at \$150. Replacement cartridges are between \$75-\$100, but a single cartridge produces thousands of pages and the home user will purchase a new cartridge very infrequently. Laser printers seem to have a longer life than an ink jet printer, meaning you'll use it a long time, possibly longer than your computer itself. Print quality: clean and sharp, vastly superior to ink jet print quality, but home models are generally only in black/greyscale. Recommended model: Brother.

### **Scanners**

Scanners convert print and photograph film into digital files. A very decent HP scanner can cost as little as \$100, but professional quality scanners can be very expensive. If you just want to scan family photos, a \$100-\$150 model will serve you well. Scanners come with installation software, but Windows XP machines often recognize the scanner automatically and no software installation is required.

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## USB PORTS

USB ports are essential for adding peripherals to your computer (mouse, printer, DVD-ROM drive, digital camera, etc.) Choose a computer with the largest number of USB port that you can find.

A desktop can have up to 8 or so USB ports and a laptop up to 3 or so. With a desktop it's especially handy to have USB ports in the back *and* front of the machine.

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## SOFTWARE

### **Microsoft Office (MS Word, Excel, etc.)**

Microsoft Word is the one program that's almost essential to every computer user. The basic usage of MS Word & MS Excel of these programs is very simple, and you can ease into complex usage over time. MS Word is the standard for creating documents, and if a friend sends you a document, it'll very likely be in MS Word. MS Excel is the standard spreadsheet program, and you'll find this useful for dealing with finances and such.

MS Word and Excel come bundled in a package called MS Office Suite. **MS Office Suite Home Edition** should be adequate for the average user. Look for this in your computer specs or ask about it over the telephone when ordering your computer.

If your computer does not come with MS Office installed, you'll probably pay \$150 for the package. Having MS Office pre-installed at the factory will save you a small installation headache.

### **Adobe Acrobat Reader**

If it's not already installed on your computer (Start > Settings > Control panel, click on "Add or remove programs), install Adobe Acrobat in order to view .pdf programs. Find this *free* (and make sure to choose the free one, there are others that cost money that you probably don't need yet) program at:



<http://www.adobe.com/> and click the “Get Adobe Acrobat Reader” button.

It’s often pre-installed at the factory now. Check your specs.

### **Internet Browsers**

Internet Explorer will already be installed on your new computer. This doesn’t mean you’re automatically connected to the Internet (see Internet discussion below). Some users don’t like the dominance of the Microsoft corporation and choose to use other Internet browsers, including the very popular *Mozilla Firefox*, available for free download at:

<http://www.mozilla.org/products/firefox/>

### **Audio programs**

Your new computer will arrive with Windows Media Player already installed, and this program will play most audio files (.mp3). If you cannot play an audio file, it’s most likely that you’ll need Real Player, another audio program, available at:

<http://www.real.com/>

Again, be sure to choose the basic FREE version.

### **Quicktime**

Sometimes little movies are placed on the Internet, or you may download one, and sometimes these play in Windows Media Player or Real Player (see above). If they do not, you may need Quicktime, available for free from Apple at:

<http://www.apple.com/quicktime/download/>

Again, be sure to choose the basic FREE version.

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## CONNECTING TO THE INTERNET

Almost everyone wants to connect to the Internet, and you do this through an ISP (internet service provide, pronounced “I” “S” “P”, not “isp”). Some new computer buyers believe that when they buy a new computer they automatically are connected to the Internet. This isn’t true. You have to connect your computer to a telephone jack with a telephone cord OR to a cable box with a cable **TO AN ISP** in order to bring the Internet to life on your computer.

Note that whatever ISP you choose, you’ll automatically get an e-mail account. For a more interesting looking e-mail account, contact the alumni association of your college or university—you may be able to get an e-mail account through them and have a nifty e-mail address like [pburley@umich.edu](mailto:pburley@umich.edu) (mine) or [myname@nyu.edu](mailto:myname@nyu.edu). Of course free e-mail accounts are available from Yahoo or Hotmail. Go to their sites to sign up.

Here are your ISP options:

### 1. Dialup: cheap. \$10/month

- **Slow** for browsing Internet, but good enough for some people.
- Local ISP – fairly reliable, or AOL, more expensive but extremely easy to use, and well-liked.
- Good enough for sending and receiving text-only e-mail, tolerably fast enough for e-mailing and receiving digital pictures, works slowly for viewing Internet pages.

- Ties up your telephone line.
- Some minor problems connecting at peak times, along with some unexplained down time.

## **2. DSL Broadband: medium expensive. \$15-\$30 month.**

Personally, I know the least about this kind of connection. I have a Time Warner cable modem at home (see below). In New York City, check out <http://www22.verizon.com/> or call them up for more information. Features:

- **A LOT FASTER** than dialup.
- More than fast enough for any e-mail (text or graphics), and more than fast enough for using the Internet.
- Comes via your telephone line, but doesn't tie up your line like dialup.
- Maybe you can install it yourself at home – cheaper option.
- Little down time. Pretty reliable that way.

## **3. Cable Broadband: most expensive. \$40-50/month.**

- Just plain **Fast**. As fast or faster than the access we have in the Library.
- Connects in no way to your telephone line, so no tying up your telephone line. Connection to your cable box, although if you don't have cable, don't worry, they'll put a cable box in your house just for cable modem access.
- You can install it at home yourself (supposedly) or have someone come and do it. It takes them literally minutes.



- Little down time. If you have a problem, Time Warner is extremely helpful on the phone and they'll correct your problem without a repair person, for the most part.

## EXAMPLE #1

**OPTIPLEX™ 170L DESKTOP**

**INCLUDES FREE 15" FLAT PANEL DISPLAY**

**Network Optimized, Advanced Business Desktop**

- **Intel® Pentium® 4 Processor**  
(2.80GHz, 1MB L2 Cache, 533MHz FSB)
- **Microsoft® Windows® XP Professional Edition**
- Dell OpenManage™ Remote Management Software Available
- 512MB Shared\* DDR SDRAM
- 80GB\* (7200 RPM) Hard Drive; 48x CD Burner/DVD Combo Drive
- 1-Yr Economy Service Plan (Ltd. Warranty,\* On-Site Service,\* Tech Support)

- Plus FREE Dell™ E153 15" Flat Panel Display (\$229 Value)
- Plus FREE 3-5 Day Shipping\* with Purchase (\$71 Value, \$19 Handling Charge Applies)

Reg Price	<b>After \$60 Discount</b>	Lease as low as
<del>\$759</del>	<b>\$699</b>	<b>\$19</b> /mo., (48 pmts.*)
		<b>E-VALUE Code:</b> <b>05300-S30906g</b>

**Recommended Upgrade:**

- 3-Yr Standard Service Plan (Next Business Day On-Site Service\* and advanced Tech Support), add \$118

## EXAMPLE #2

# DELL OUTRAGEOUS

## DIMENSION™ 3000 DESKTOP

### Includes 17" Flat Panel Display

#### Ultimate Value Desktop

- Intel® Pentium® 4 Processor (2.80GHz, 1MB L2 Cache, 533MHz FSB)
- Microsoft® Windows® XP Home Edition
- Corel™ WordPerfect® Word Processor
- 256MB Shared\* DDR SDRAM
- 40GB\* (7200 RPM) Hard Drive
- 48X CD-ROM Drive
- 90-Day Economy Service Plan (Ltd. Warranty,\* On-Site Service,\* and 90-Day Tech Support)
- Includes Dell™ E173FP 17" Flat Panel Display
- Plus FREE 3-5 Day Shipping\* with Purchase (\$71 Value, \$19 Handling Charge Applies)

**TOTAL SAVINGS**  
**\$351**

Reg Price  
~~\$729~~

Pre-Rebate  
~~\$599~~

After \$130 Discount and  
\$150 Mail-In Rebate\*

**\$449**

Lease as low  
as **\$16**/mo.,  
(48 pmts.\*)

E-VALUE Code: 05300-S50904g

#### Recommended Upgrades:

- 80GB\* (7200 RPM) Hard Drive, add \$30
- 2-Yr Economy Service Plan (On-Site Service,\* 2-Yr Tech Support), add \$49
- 512MB Shared\* DDR SDRAM, add \$50
- Microsoft® Office Basic Edition 2003, add \$149

## EXAMPLE #3

### EMACHINES T3104

#### Specifications

<b>CPU:</b>	AMD Sempron™ 3100+ Processor (64-bit) (256KB L2 cache, 1.80GHz, 1600MHz FSB)
<b>Operating System:</b>	Microsoft® Windows® XP Home Edition SP2 <sup>1</sup>
<b>Chipset:</b>	VIA K8M800
<b>Memory:</b>	256MB DDR SDRAM (1x256MB), 400MHz (PC3200) Expandable to 2GB
<b>Hard Drive:</b>	100GB (7200 RPM, 2MB cache) <sup>2</sup>
<b>Optical Drives:</b>	48x CD-RW/DVD Combo Drive
<b>Media Reader:</b>	8-in-1 Digital Media Manager (Secure Digital (SD), Smart Media, Micro Drive, Memory Stick, Memory Stick Pro, Compact Flash, Multimedia Card, USB 2.0)
<b>Video:</b>	S3 Graphics Unichrome™ Pro 64MB DDR Shared Memory AGP 8x slot available for upgrade
<b>Sound:</b>	AC '97 Audio, Dolby 5.1 (6- channel)
<b>Modem:</b>	56K ITU V.92 ready Fax/Modem
<b>Network:</b>	10/100Mbps integrated Ethernet LAN
<b>Peripherals:</b>	Standard Multifunction Keyboard,

## 2-Button Wheel Mouse, Amplified Stereo Speakers

**Dimensions:** 14.25"H x 7.25"W x 16.00"D

**Ports/Other:** 5 USB 2.0 (4 in back, 1 in Media Reader), 1 VGA external connector, 1 serial, 1 parallel, 2 PS/2, 5 audio ports (2 in front, 3 in back)

**Pre-Installed Software:** Microsoft® Works 8.0<sup>1</sup>, Microsoft® Office 2003 Trial<sup>3</sup> (Student Teacher Edition), Adobe® Acrobat® Reader, Microsoft® Money 2005, Microsoft® Encarta Online, Microsoft® Windows Media Player 10, CyberLink® PowerDVD, RealNetworks RealPlayer®, Napster 3.0 (30-day trial)<sup>4</sup>, Quicktime, Microsoft® Internet Explorer, AOL 9.0 ([6 months membership included](#). Additional phone charges may apply.), Google Toolbar, Norton Internet Security™ 2005 (90-day complimentary trial)<sup>5</sup>, McAfee Anti-Spyware (30-day complimentary trial)<sup>6</sup>, eMachines BigFix®<sup>7</sup> - identifies and resolves problems that affect the system before they occur

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## THE CHECKLIST

Here's some critical questions I'd confirm via telephone when ordering a computer. Even if you can clearly see them in the computer specs/newspaper advertisement, why risk an unpleasant surprise? Sending a computer back through the mail or UPS or installing new hardware or software isn't always easy.

- Exactly which processor (Celeron, Pentium 4, etc.) does this computer have? How **FAST** is the processor?
- Exactly how much RAM does this computer have? How much does extra cost? Is there a free deal on some more, or is that kind of deal coming up in a few weeks?
- What kind of monitor comes with this computer? (standard box vs. flat-screen)
- How many USB ports are there? (Laptop users beware! 3 would be nice). How much are extra USB ports? Are USB ports located in the front of the machine as well as the back? (Desktops only)
- Is there a telephone jack/port? (of course, but ask)
- Is there an ethernet port? (careful on this one: critical) Wireless? (Not covered in this class).
- Is there a floppy disc drive (not necessarily standard with laptops)?
- Is there a CD drive (standard on desktop, ASK with laptops)? CD-RW drive? DVD drive? DVD-RW drive?
- How fast is it? (see discussion above)
- What are the levels of warranty? (more important with laptops)



- What software is bundled (comes automatically installed) with this machine? (Make sure you get MS Word & Excel—see discussion above)
- Do any free peripherals come with this package (printer, scanner, digital camera, speakers)
- How much am I going to pay for shipping (can be \$100+)