Introduction to Computers

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Welcome! This class will introduce you to the wonderful world of computers! You will learn:
- History of computers
- Parts of a computer
- Windows® Basics (sorry, I don't do Macs)
  - Managing files and directories
  - Changing settings
  - Running common programs
- Typing (typing tutor programs help)
- Computer trivia
- Fun, prizes, and much, much more!!!

Each class has three parts:
- **Show and Tell**: Students share a new computer fact or how to do something on the computer.
- **Typing Showdown**: Students are timed typing a short selection of wholesome text.
- **Trivia and Demo**: Mr. B shares some computer trivia and show how to do something new.

Prizes! Students who share a computer fact or "how to", as well as those who win each week's Typing Showdown earn a weekly mini-prize! At the last class, the student with the most weekly prizes wins a $5 gift card and bragging rights. The fastest and the most improved typists also each win $5 gift cards.

✁ -

Student Responsibilities (*sign, detach, and return on the first day of class*)
- Come to class on time and prepared, with paper and pencil, for taking notes.
- No talking when Mr. B is talking. Raise your hand, if you have a question.
- Try to participate in class activities, and do your best if called upon.
- 1-2 hours of homework each week includes:
  - Find one computer trivia fact NOT discussed in class, along with where it was found.
  - Figure out how to do something new in Windows, and be ready to demo it.
  - At least 30 minutes of typing practice, recorded on typing log.
  - Go over notes given in class and repeat demos done in class.

Failure to Comply
- First incident will result in a verbal warning.
- Further problems may result in trip to Study Hall and parent-teacher conference.
- Expulsion from class is the option of last resort.

Student Name: _____ **Date**: _____

Computer Experience (please check one): ☐ Not much   ☐ Pretty knowledgeable   ☐ Total geek

Student Signature: _____ **Parent Signature**: _____

Typing Training Log

Name: _____

		Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.
Week #0	Practice (mins)							
	Speed (WPM)							
Week #1	Practice (mins)							
	Speed (WPM)							
Week #2	Practice (mins)							
	Speed (WPM)							
Week #3	Practice (mins)							
	Speed (WPM)							
Week #4	Practice (mins)							
	Speed (WPM)							
Week #5	Practice (mins)							
	Speed (WPM)							
Week #6	Practice (mins)							
	Speed (WPM)							
Week #7	Practice (mins)							
	Speed (WPM)							

Introduction to Computers
Day 1

Desktop and Laptop – Connect the part to its name.

Computer/Tower – houses the computer's innards

Monitor/Screen – displays graphics, text, and video
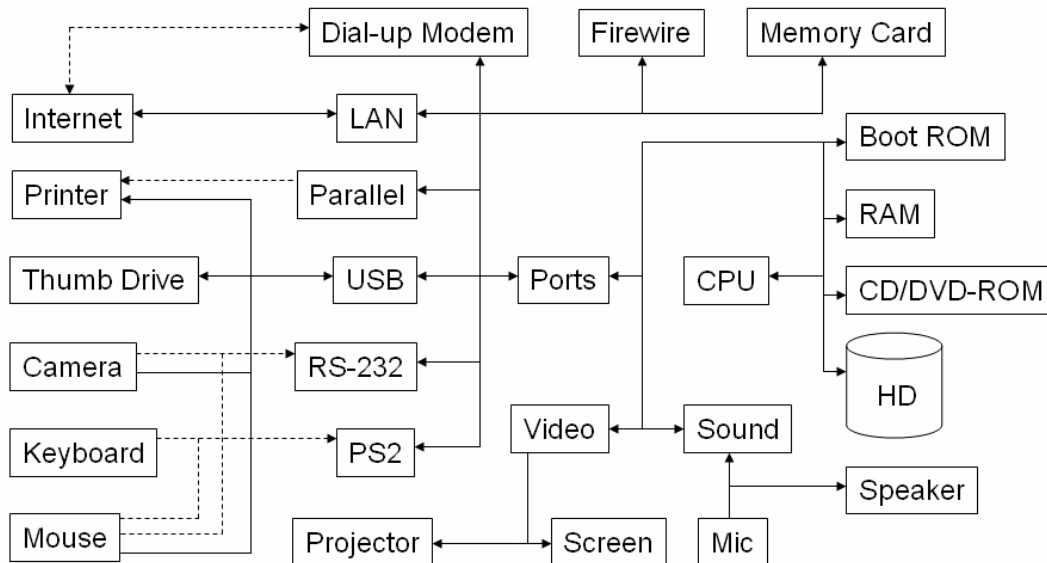
Speakers – audio output

Keyboard – text-based human interface device

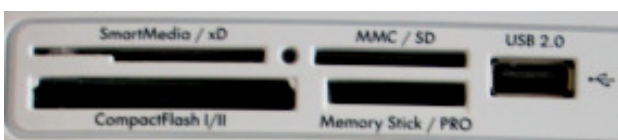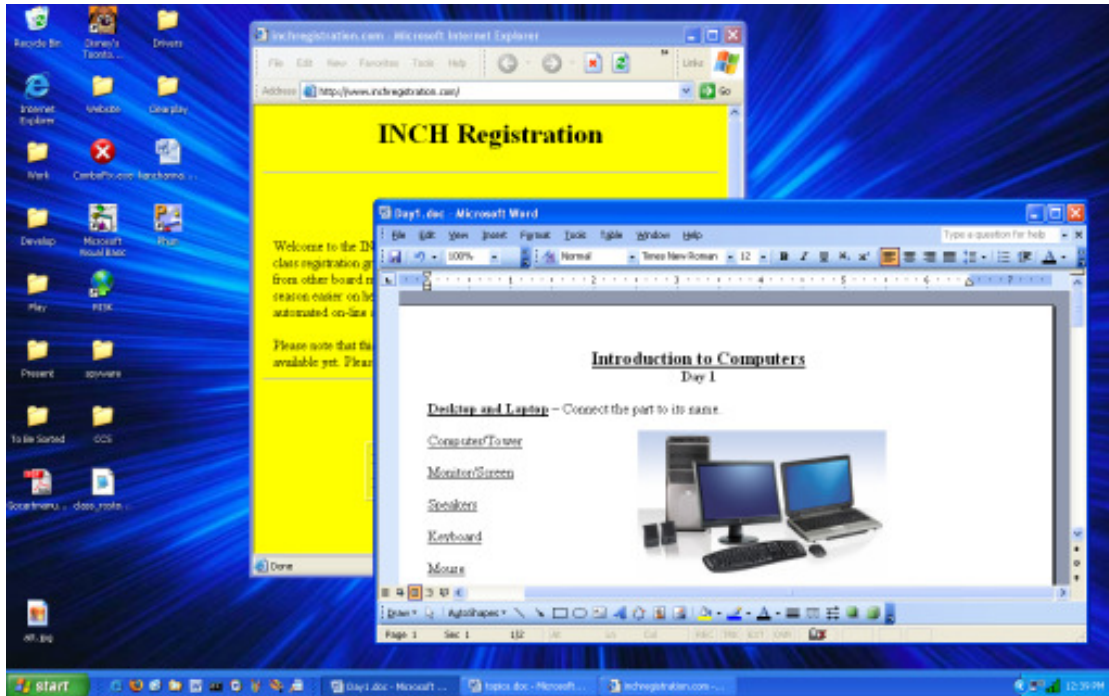*Mouse* – point-and-click human interface device

Photo courtesy of DELL.

Block Diagram – Write the full name of each acronym.

Ports – Label as many of the ports in the pictures, as you can.

Windows Desktop – Label the main elements of the desktop.

Typing Tutors

- You can practice even without a tutor, especially if someone at home knows keyboarding.
- The most important thing to know is to put your hands on the keyboard, so that your index fingers are on the F and J keys (the ones with the little bumps on them).
- DO NOT LOOK AT THE KEYBOARD!!! Do anything you can to avoid cheating, as it will actually impede your progress. I went so far as to cover up the keys on the keyboard that we're using for the Typing Showdowns.
- Typing tutors give you important tips, customized lessons, performance tracking, as well as motivation to learn, through games and activities.
- Search for "typing" at Amazon.com, to find popular tutoring programs at low prices, as well as helpful customer reviews.
- One of the top sellers is *Mavis Beacon*, which we will use in class, for the Typing Showdowns.

Introduction to Computers
Day 2

Veggie Tales

What is the name of Bob and Larry's computer?

What is the significance of the name?

Memory Addressing

How does the US Postal service know how to deliver something to you? In the real world, we have many ways of addressing people:
- Name/nickname
- Street/P.O. box
- Phone number
- E-mail address
- Personal website/blog/MySpace/FaceBook

A CPU uses unique numbers, called *addresses*, to chat with its *peripherals* (memory, disks, ports, etc…). It changes hardware settings and manages data I/O by writing and reading numbers into and out of those addresses.

As an example, imagine a computer screen as a giant wall of P.O. boxes, where each pixel (dot) is a numbered box. The color of the pixel depends on the contents of the box.

The CPU can control most peripherals by writing or reading values into memory-mapped locations, called *registers*. A register is like a little chunk of computer memory, designed to control specific functions. For example, when the CPU wants to send data packets over LAN, it writes the data, a little at a time, to a register on a controller chip that's on the LAN card. The controller chip then handles pushing the data over the actual wires. Likewise, the same controller chip places any incoming data into another onboard register, which the CPU can read.

Folders and Directories

You cannot have all your stuff scattered all over your room (or house!), else you'll have trouble finding anything! Likewise, you need to get in the habit of organizing your stuff.

In general, a *directory* is a container for other files and subdirectories. *Subdirectories* are just directories inside *parent directories*. Directories are represented graphically using a *tree structure*.

In Windows (and Macs), directories are called *folders*, and they are represented by icons that actually look like real-life folders.

File Explorer

The Windows *File Explorer* is a graphical tool for managing the files and folders on your computer. You can launch it in any of the following ways:

- Press *Start* button, right-click on *My Computer*, and choose *Explore* (from the context menu).
- Find *My Computer* on the Desktop, and double-click on it.
  - You may need to find the *C:* drive (which is usually the designation of the computer's primary harddrive, and double-click on it, too.
  - If you don't see the tree of folders on the left, click on the *Folders* button (which looks like a couple of folders), in the toolbar.
  - If you don't see the toolbar, choose *View ⇨ Toolbars ⇨ Standard Buttons*, from the menu.
- Press *Start ⇨ Run*, type *explorer.scf*, and press *OK*.
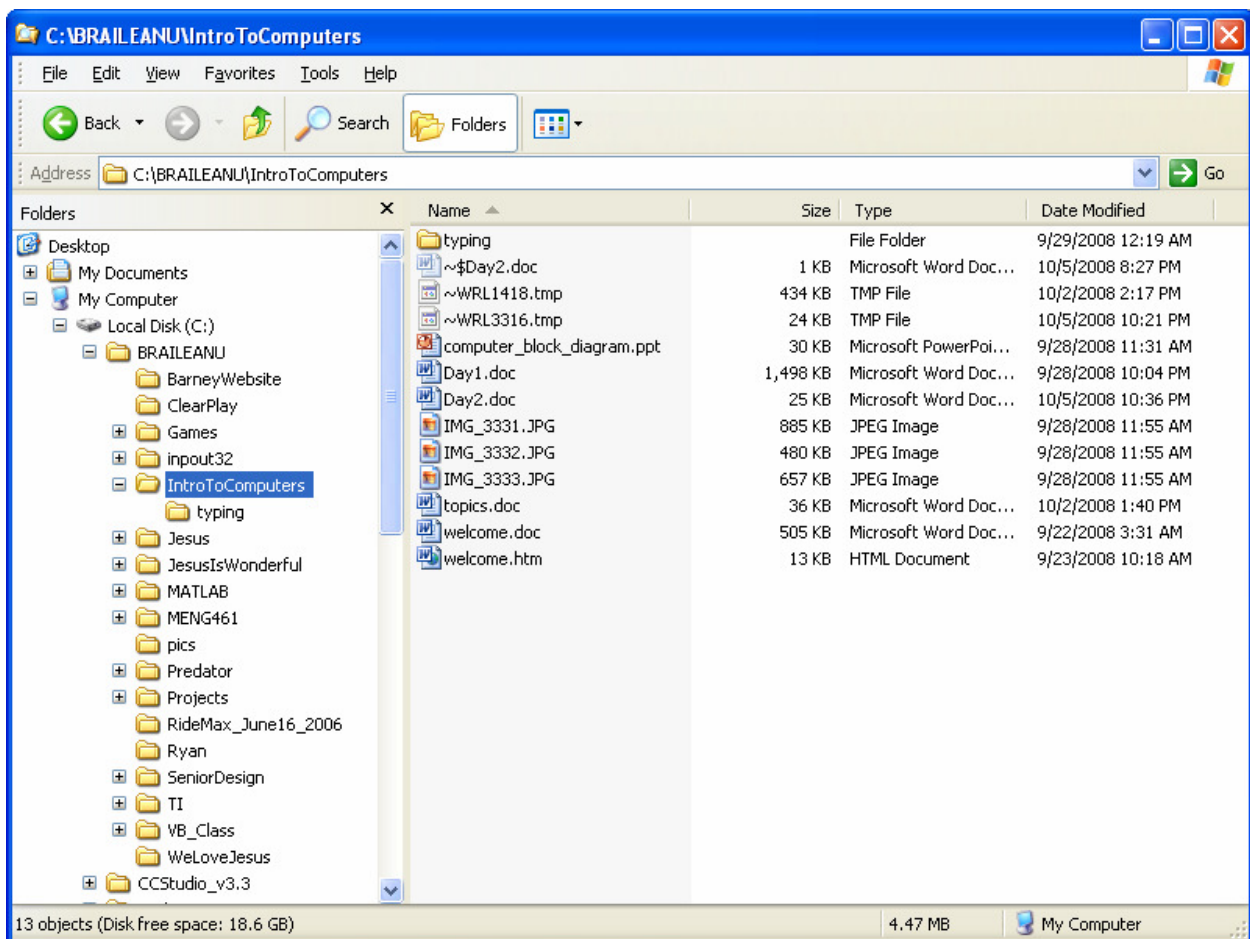
- Click on a folder on the left, to see its contents on the right.
- Double-click on a folder on the right, to go into it and see its contents.
- Use the + and - buttons next to a folder on the left, to expand or collapse the list of subdirectories inside it.
- Double-click on a file on the right, to open it, using the default application for that type, or right-click on the file, choose *Open With*, and select the program to use.
- Careful not to move or delete any files, yet, until you know what you're doing!

Introduction to Computers
Day 3

Colors on a Computer: RGB

In the real world, there are three primary colors: red, yellow, and blue. When combined on a white canvas, these can be used to create any color imaginable! But what if the canvas is black, and the paints are points of light, as on a computer screen? Turns out that yellow gets replaced with green, and the color combinations become very counter-intuitive!

Every pixel (or dot) on a computer screen is capable of displaying any combination of 256 intensities of red, green, and blue (RGB). An intensity of 0 means "no color", while 255 means "maximum brightness".

To find out how many different colors a computer screen can display, all we do is multiply the RGB intensity levels together: 256 x 256 x 256 = 16,777,216 colors!!!

Common Color Combinations

We will use the form (r, g, b) to represent colors on a screen, where r is the intensity of red, g is the intensity of green, and b is the intensity of blue.

If we combine equal amounts (intensities) of red, green, and blue, we always end up with a shade of grey, from black to white. For example, (0, 0, 0) is pitch black, (20, 20, 20) is a dark gray, (200, 200, 200) is a light gray, and (255, 255, 255) is pure white. How many pure shades of gray can a computer display?

To get a pure red, green, or blue, simply set that color's intensity, while leaving the other two colors at 0.

Here is a table of some other common colors. Drawing programs, such as Microsoft Paint, Jasc Paint Shop Pro, and Adobe Photoshop, can be used to find the RGB code of any color. But note that there are some regions of the color wheel that cannot be represented by the over 16 million RGB combinations.

| RGB Code	Color	RGB Code	Color	RGB Code	Color
(153, 51, 0)	Brown	(255, 153, 204)	Rose	(0, 51, 102)	Dark Teal
(255, 102, 0)	Orange	(255, 204, 153)	Tan	(51, 204, 204)	Aqua
(255, 255, 0)	Yellow	(153, 204, 0)	Lime	(128, 0, 128)	Violet
(255, 0, 255)	Pink	(0, 128, 128)	Teal	(204, 255, 255)	Pale Blue

Image Formats

Like everything else in a computer, images are stored as files containing numbers. The easiest and most accurate way to store a picture is to save the RGB code for every pixel in the image. This is what the 24-bit Windows Bitmap (BMP) format does. Unfortunately, BMP images take up a lot of space on the harddisk and would take a long time to download off the internet.

One way to save a ton of disk space is to limit the number of colors in the picture. For example, if we decide to use greyscale (256 shades of gray, including black and white), a BMP picture will occupy 1/3 the disk space of its full-color counterpart. Why do you think this is? Think about RGB color representation.

But for digital cameras, mass-storage, and the internet, we want small file sizes AND lots of colors. Computers accomplish this through a mathematical procedure called *data compression*. Depending on the compression algorithm, the computer tries to reduce the amount of information in the image, by taking advantage of patterns in the image and by compromising on image quality. There are two very popular image formats that do this, but they have different strengths and weaknesses, making each one suitable for different kinds of pictures.
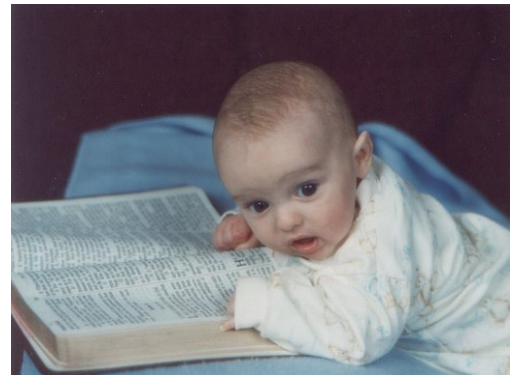
Take a look at the pictures below. What would you do to reduce the amount of storage needed for each image? How would it affect the picture quality? (There is more than one answer.)
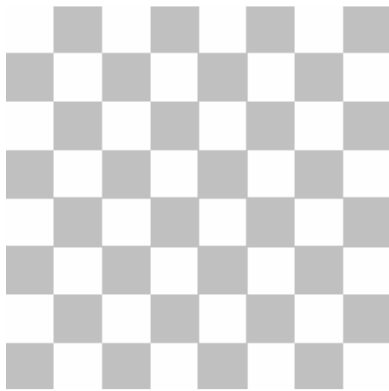
64 x 64   400 x 600   514 x 385

JPG (J-Peg, pronounced "JAY-peg") files support the full RGB color range, but at the cost of introducing slight blurring and shadows along sharp edges in the image. While that would be a problem in a crisp-edged drawing (such as a company logo), it's barely noticeable in a photograph or painting. For this reason, most photos are stored as JPG.

GIF (pronounced like "gift", but without the 't') maintains crisp edges, but limits the image to 256 colors. The good news is that it defines a color palette in the file, allowing the user or painting program to pick the 256 colors that will best match the ones in the original image. Even so, photos will look miserably dithered (speckled with pixels that look out of place). Therefore, GIF compression is best for drawings. GIF also supports transparency, which allows a non-rectangular object in the image to be superimposed on another image or background; a very useful feature in website design.

Launching Microsoft Paint

Every version of Windows (since 3.0, at least) has come with a simple drawing program called Paint. To launch it, click on *Start ⇨ All Programs ⇨ Accessories ⇨ Paint*. To make a desktop shortcut to Paint, right-click on the Paint icon in the Start menu and select *Copy*. Then, right-click in an empty area on your desktop, and choose *Paste*.

Introduction to Computers
Day 4

Operating Systems

An *operating system* (OS) is a computer program that manages a computer's basic functionality and provides high-level, hardware-independent support for file management, executing programs, and I/O (pronounced "eye-OH", meaning "input and output"). It makes it easier for a user or a program to do things, without worrying about the fine details, such as where peripherals are in the address space.

Before Windows: DOS

Before 1984, operating systems were text-based. Users had to type command-line instructions to navigate directories (folders), move files, and run programs. A common such OS was called DOS: Disk Operating System. In 1981, a young college student named Bill Gates and his classmate created their own version of DOS, called MS-DOS. They used its popularity to launch a software empire called Microsoft.

DOS lives on in Windows, as a *command shell*. Click on *Start ⇨ All Programs ⇨ Accessories ⇨ Command Prompt*. *Alt-Enter* toggles between window and full-screen modes.

Typically, you type a command and any necessary arguments, and then press the *Enter* key. The result is displayed in the same window. Type *help |more* and press *Enter*, to see a list of commands. Press *Enter* to advance the display by a line, *SpaceBar* to advance it by a whole page, or *Q* to exit the multi-page display mode..

```
C:\BRAILEANU\IntroToComputers>dir
 Volume in drive C has no label.
 Volume Serial Number is E032-B9C4

 Directory of C:\BRAILEANU\IntroToComputers

10/18/2008  11:28 PM    <DIR>          .
10/18/2008  11:28 PM    <DIR>          ..
09/28/2008  11:31 AM            30,720 computer_block_diagram.ppt
09/28/2008  10:04 PM         1,533,440 Day1.doc
10/06/2008  12:10 AM           107,008 Day2.doc
10/13/2008  12:44 AM           180,224 Day3.doc
10/18/2008  11:28 PM           181,248 Day4.doc
09/28/2008  11:55 AM           905,534 IMG_3331.JPG
09/28/2008  11:55 AM           491,140 IMG_3332.JPG
09/28/2008  11:55 AM           672,163 IMG_3333.JPG
10/02/2008  01:40 PM            36,864 topics.doc
09/29/2008  12:19 AM    <DIR>          typing
10/06/2008  12:31 AM            47,616 typing_log.doc
09/22/2008  03:31 AM           516,608 welcome.doc
09/23/2008  10:17 AM            13,281 welcome.htm
              12 File(s)      4,715,846 bytes
               3 Dir(s)  20,185,731,072 bytes free

C:\BRAILEANU\IntroToComputers>_
```
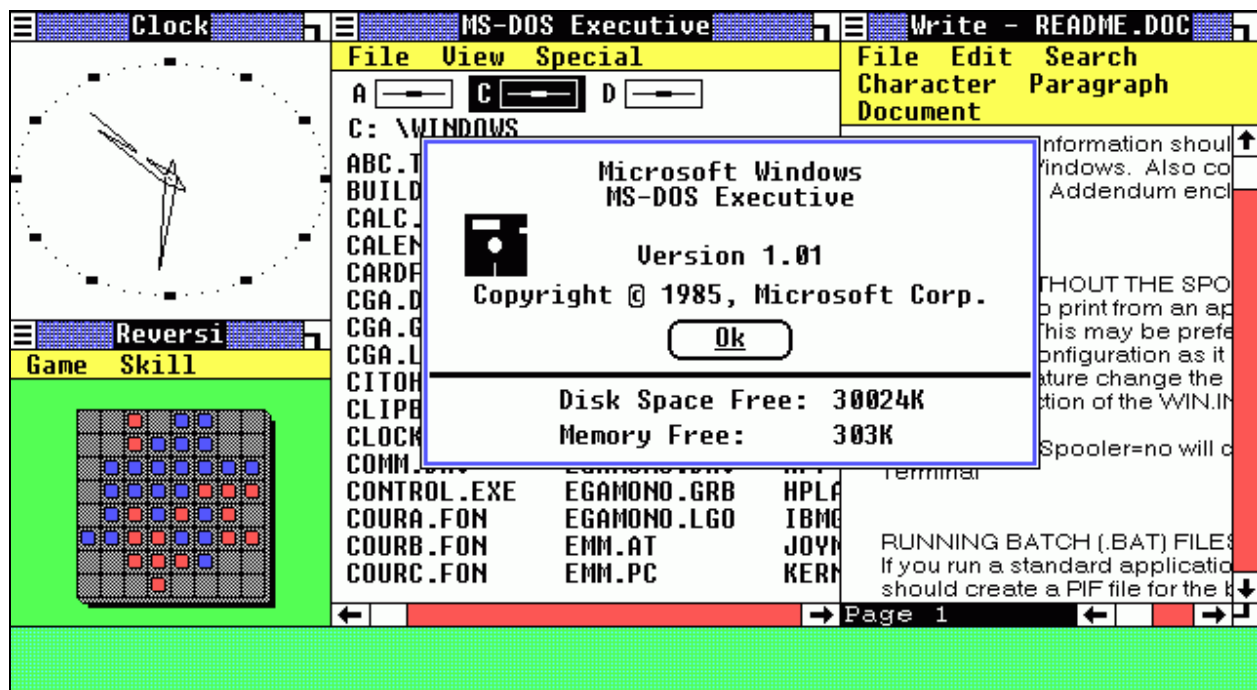
Windows History

A year after helping Apple create the widely popular and revolutionary graphical interface of the Macintosh in 1984, Microsoft released the first version of Windows. The computer would boot to DOS, and the user would start Windows by typing *win* at the command prompt. Windows was not a true OS, but a program that ran on top of DOS, much like a game or drawing program today.

Clock MS-DOS Executive Write – README.DOC

File View Special   File Edit Search
A [——] C [——] D [——]   Character Paragraph
C: \WINDOWS   Document

ABC.T   nformation shoul
BUILD   Windows. Also co
CALC.   Addendum encl
CALEN   Microsoft Windows
CARDF   MS-DOS Executive
CGA.D   THOUT THE SPO
CGA.G   Version 1.01   o print from an ap
CGA.L   Copyright © 1985, Microsoft Corp.   This may be prefe
CITOH   onfiguration as it
CLIPB   [Ok]   ature change the
CLOCK   tion of the WIN.IN
COMM.   Disk Space Free: 30024K   Spooler=no will c
CONTROL.EXE   EGAMONO.GRB   HPLP Terminal
COURA.FON   EGAMONO.LGO   IBMC
COURB.FON   EMM.AT   JOYM RUNNING BATCH (.BAT) FILES
COURC.FON   EMM.PC   KERN If you run a standard applicatio
                                          should create a PIF file for the
←   → Page 1   ←   →

Reversi
Game Skill

Windows 95, released in 1995, was the most dramatic change in the OS. With it, Windows traded places with DOS, becoming a true OS, while DOS became a command shell program that ran from inside Windows.

Today, the DOS shell (also called a *console*) serves very little purpose for average users. It exists mainly to allow old DOS programs to run, and to provide savvy users with utilities that are otherwise inaccessible from Windows. It can also be used to run *scripts* (automated sequences of commands) that perform simple, mundane tasks.

Platform Dependence

How a *program* (or *application*) interacts with the computer depends on the type of CPU and OS that it was designed to run on. It can only use that operating system's unique *API* (*application programming interface*) and the unique set of binary instructions that the CPU can understand. This is why Macintosh, Windows, and video game systems by competing companies are incompatible with each other. Also, newer programs that take advantage of new APIs that get added to newer versions of Windows will not work on older versions of Windows.

On a Windows PC, there are two kinds of applications: console (which use the DOS API) and Windows (which use the Windows API). In general, console programs are purely text-based (like the DOS shell), but they can do graphics, through the use of *graphics libraries*. Windows programs, on the other hand, are naturally graphically oriented; when you want to create a window or control, you just set some properties, without worrying about how to exactly draw everything.

More recently, Microsoft developed a programming model called .NET ("dot-NET"). Its major advantage is that programs that are created with .NET can run on any kind of computer or operating system that support .NET. What's even cooler is that they have also developed a .NET-based graphics library that allows people to create games that run on both, Windows PCs and the Xbox.

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Day 5

Creating a Folder

You can create a folder directly on the desktop or using *File Explorer*. To create one on the desktop, right-click over the background and choose *New* ⇨ *Folder*. A folder called "New Folder" will appear, with its name selected (highlighted in blue). You do not want to leave it with this undescriptive name, so give it the name you want, and either press Enter or click anywhere, when finished. To rename the folder in the future, click on it once to select it, and then click on its name.

Creating a folder in *File Explorer* works in a similar fashion. Use the folder tree in the left pane, to select the folder inside which you want to create your new folder. Then, anywhere in the white area of the right pane, right-click and select *New* ⇨ *Folder*. Rename it, and off you go!

Naming Folders

In Windows, you can name a folder pretty much anything you want, as long as you don't use certain special characters or make the name excessively long. The characters you cannot use are:

<p style="text-align:center; color:red; font-size:large;">\ / : * ? " < > |</p>

I recommend sticking to letters and numbers only. While Windows allows the use of spaces between words in folder and file names, some really old programs don't handle that very well, so I strongly recommend using _ (underscore) instead of spaces, or using "camel casing". Ex: *my_tennis_pictures* or *MyTennisPictures*.

File Extensions

Same rules apply to file names as for folder names, but with one exception: file names almost always end with a period and a 3-letter *extension*. Some files have no extension, while others have extensions with more or fewer than 3 letters, but 3 is the standard. Windows uses the extension as a first pass to determining a file's type. The file type, in turn, determines what icon to display for that file and what program to open it with. This is important, because practically every program out there uses its own custom file type.

IMPORTANT NOTE: Changing the extension of a file will NOT change its type (because that information is actually stored inside the file itself), but it may confuse Windows enough to cause errors, when you try to open that file. Furthermore, NEVER change the extension of an e-mail attachment that you receive; this is a COMMON TRICK to sneak a virus past your anti-virus scanners and infect your computer.

Viewing File Extensions

Since you can do a lot of damage by changing file extensions, Windows defaultly hides them from you. This is not normally a problem, but I wasted over an hour once, because of it. To see them in *File Explorer*, select *Tools* ⇨ *Folder Options…* from the menu. A new window will pop up. Half-way down the *View* tab, uncheck the box for *Hide extensions for known file types*. If you want this change to affect all folders (not just the one you're currently looking at), press the *Apply to All Folders* button, at the top of the *View* tab. Click *OK* when finished.

Known File Types

We mentioned earlier that Windows knows what program to use to open files of each type. You can look at (and even change) this list. In the *File Explorer* menu, go to *Tools ⇨ Folder Options…*, and choose the *File Types* tab. There, you'll see a list of each file extension, along with a short description. Clicking on a line in the list displays the name of the program Windows uses to open that kind of file.

WARNING: You may be tempted to pull a prank on a sibling, friend, or parent, by changing the program that opens common file types. NEVER CHANGE THE DEFAULT PROGRAM, unless you know what you're doing. You may end up messing up the computer, not to mention possibly causing hours of frustration for anyone else who uses it.

Creating New Files

Most of the time, you create new files either from inside a program you're using (such as *Paint* or *Notepad*), or by copying an existing file, such as an image or a document. But you can also create files directly from the desktop or *File Explorer*. Right-click on the desktop or an empty area in *File Explorer*'s file view, and choose *New*. A second context menu will appear, from which you can choose the type of file to create. This is sometimes faster than finding the program that will create that kind of file. You can then rename your file, and when you double-click on it, Windows will open it, using the appropriate application.

Open With

You may not always want to open a file using the same application all the time. For example, images can be edited in *Paint* or in a more advanced program, such as *Photoshop*. Text files can be edited in *Notepad*, *Wordpad*, or something else. HTML files are usually viewed in a browser, but must be edited with some other program.

To open a file with a different application, right-click on the file, choose *Open With*, and make your selection from a list of compatible programs.

Searching for a File

Have you ever lost the 10-page paper you've been working on, for U.S. Elections? Or maybe the latest Newsboys hit single, that you downloaded just the other day? Windows has a feature that searches for a file name or its contents. Just right-click on the folder that you want to search in (can be the *C:* drive, if you wish), and select *Search…*(in older versions of Windows, this feature was called *Find*). A search window will pop up, similar to *File Explorer*. In the left pane, type part of the filename or a word or phrase in the file. More options are available, to help narrow down your search. The less you type, the more files it's likely to find. But if you type something too specific, and you're wrong, the search may come up empty. When ready, hit the *Search* button. Your results will show up on the right.
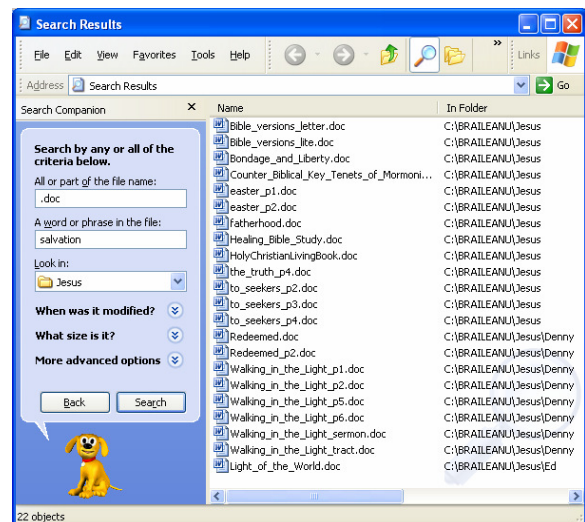
Introduction to Computers
Day 6

What is a Byte?

Computers measure size of data storage in *bytes*. A byte is a numerical unit of storage composed of 8 binary values called *bits*. Since a bit can only have 2 values (0 or 1), a byte has $2^8 = 2$ x 2 x 2 x 2 x 2 x 2 x 2 x 2 = 256 different values. (Where have you seen 256 before?) 2^8 is read "two to the eight".

A kilobyte (KB) is $2^{10} = 1024$ bytes, a megabyte (MB) is $2^{20} = 1,048,576$ bytes, and a gigabyte (GB) is $2^{30} = 1,073,741,824$ bytes.

Data Representation and Compression

To give you some idea of how much data can be represented in bytes, a single printable (ASCII) character takes up one byte, the average page of plain text is about 2400 bytes, and the Bible (OT and NT) is about 4.5MB. A CD or CD-R can hold about 700MB of data, while a traditional DVD or DVD-R holds about 4GB (that means you can fit almost a thousand bibles on a single DVD!).

However, you can fit even more data into fewer bytes, if you use *data compression*. If you remember, compression is when you use mathematical formulas to take advantage of patterns in the original data, to reduce the number of bytes it takes to store it electronically. This works not only for pictures, but also for text, programs, audio, and video; any kind of file!

The degree of compression depends on the original information and how much distortion, noise, or data loss (corruption), you're willing to put up with. For example a CD can hold up to 21 3-minute songs, uncompressed. But since most people cannot hear all the frequency components present in the song, WMA and MP3 compression can be used to decrease the amount of space needed to store the song, by sacrificing some of the sound fidelity. Using this technique, you can fit 100-200 songs on a single CD-R (but older CD players won't be able to play it!). On the other hand, if we want to compress the bible, we cannot allow any data loss, else we introduce typos into the text. *WinZip* uses loss-less compression, so that no errors are introduced into documents or programs.

It's important to understand that compression is used only to save on storage and download times. Since people cannot use the data in its compressed form, whatever is used to read it needs to *uncompress* the data, so it can be presented to the user. This takes additional time and technology (as in the example of traditional CD players being unable to read WMAs or MP3s).

File, Folder, and Disk Sizes

To find out how much space something takes up on the computer, find it in *File Explorer*, right-click on it, and choose *Properties* from the context menu. File sizes are also listed in the detailed view. In particular, when you view a drive's properties, you get a cute pie chart that shows you how much of the volume is being used. You may not see any free space on CDs and DVDs, because Windows usually sees them as read-only media.

The status bar also shows additional statistics for the current view, such as the number of files in the current folder and how much free space is left on the current drive. To enable the status bar in *File Explorer*, choose *View ⇨ Status Bar*, from the menu.

Stalled Programs

Sometimes, a program will stall and become unresponsive. If clicking in the program's window or the window's close button doesn't do anything, you can use the *Task Manager* to end the *process*. A process is a program that runs on your computer, whose name is usually the same as that of its *.EXE* file. Every window on your screen is associated with a process, but a process can have any number of windows, or none at all.

There are four ways to bring up the *Task Manager*, depending on the version of Windows that you have.
- The most common is to press *Ctrl-Alt-Del* (at the same time), which either brings up the *Task Manager* directly or another window, which has a *Task Manager* button that you can click on.
- Another way is to right-click on an empty area of the task bar and choose *Task Manager*.
- On some versions of Windows, you can press *Alt-Esc* (or was it *Ctrl-Esc*?).
- You can also type *taskmgr* in the *Start ⇨ Run* box.

Note that *Task Manager* is always the topmost window, even if it's not the one that has focus.

Click on the *Processes* tab, and then click on the *Image Name* column, to alphabetize the tasks by name. Finding the name of the stalled application may be tricky, because most process names do not exactly match the common name of the program. For example, *Internet Explorer*'s process is called *iexplore.exe*. You might be tempted to end *explorer.exe*, instead, which actually belongs to Windows; kill *that*, and you may have to power-cycle your computer!

Click on the process you want to end, and press the *End Process* button, in the bottom-right corner of the window. You will be asked if you're sure, to which you click *Yes*.

DO NOT END A PROCESS, UNLESS YOU'RE SURE WHAT IT IS FOR! Most of the processes running on your system are required for Windows, printers, and other devices to work. To check for the description of a process, search for it at www.processlibrary.com. If your computer starts acting funny, after ending a process, just restart Windows.

Also note that when you end a process, Windows rips the rug out from underneath it, which may cause you to lose unsaved data. Use this only as a last resort, if all other efforts to close the program have failed.

Memory (RAM) Usage

Your computer has a certain amount of physical RAM (random access memory, for temporary storage of data). If most of the RAM is full (as in, you don't really have enough to go around), your computer will act sluggish. If you go to the *Performance* tab, in *Task Manager*, and look at the *Physical Memory* section, you'll see how much total RAM your system has (in KB) and how much of that is available.

There really isn't much you can do to reduce RAM usage, unless you close some programs. But if your computer is acting sluggish, due to not enough RAM, you can purchase and install additional RAM cards.

Introduction to Computers
Day 7

Windows allows you to manipulate *objects* (text, pictures, files, etc…), using several common operations. Today, we will explore the basic manipulation operations and demonstrate the various ways we can apply them.

Select

To manipulate an object, you must *select* it first. You can use the mouse to select text, by clicking the left button at the beginning of the intended selection, and holding it down as you move the cursor to the end of the selection. This is called *dragging*. As you move the mouse, the selected text is highlighted (usually in blue). In some applications double-clicking on a section of text will automatically select it.

To select an object on the desktop or *File Explorer*, simply click on it once. To select multiple objects, click on an empty area and drag the cursor across your intended selection. As you drag, a faded, dotted-line rectangle will often be shown, and as it comes in contact with objects, those objects become selected (usually turning blue).

You can also make multiple selections by holding down the *Ctrl* key, as you repeatedly click or drag.

You can also make selections using the keyboard, by holding down the *Shift* key, while you use the arrows, *Page Up* (*PgUp*), *Page Down* (*PgDn*), *Home*, or *End* keys.

Delete

The easiest way to delete a selection is to press the *Delete* (or *Del*) key. If deleting *text*, the *Backspace* (or *Bksp*) key also works, but it will *not* work with files.

If the selection has a context menu (accessible by right-clicking on it), you may use the *Delete* option, if there is one.

Depending on your Windows settings, deleting a file or folder may prompt Windows to ask if you're sure you want to do it.

Note that once you delete an object, it is generally gone forever. If Windows is set to move deleted files to the *Recycle Bin*, you can recover them. Also many programs let you *undo* the last operation (the common keyboard shortcut is *Ctrl-z*.

Cut

Cutting objects removes them from their current location and copies them to the *clipboard*, which is temporary storage, used for manipulating objects. Note that when you cut a file or folder, it becomes temporarily grayed out, until you perform the next clipboard operation.

You cut a selection by selecting *Edit ⇨ Cut* from your application's menu, selecting *Cut* from the object's context menu, or pressing *Ctrl-x*.

Copy

The copy operation copies your selection to the clipboard, for future use. Note that while some applications allow you to perform multiple copy operations, in general, each copy command purges the prior contents of the clipboard.

You copy a selection to the clipboard, by selecting *Edit ⇨ Copy* from your application's menu, selecting *Copy* from the object's context menu, or pressing *Ctrl-c*.

Paste

Pasting is copying a selection from the clipboard to a desired location. Oftentimes, you can repeatedly paste the same selection to several different locations, because it remains in the clipboard, until something else replaces it.

You paste a selection by left-clicking in the desired destination and selecting *Edit ⇨ Paste* from your application's menu, selecting *Paste* from the destination's context menu, or pressing *Ctrl-v*.

If pasting a file or folder into a location that already contains a file or folder having the same name, Windows will ask if you want to replace it.

Move

When you cut a selection from one location and paste into another, you're essentially *moving* that selection. But you can also move a selection by dragging it to its new location. In fact, Windows allows you to copy or move selections from one application to another.

You can use this dragging technique to move files from one folder to another, even between two *File Explorer* windows. To copy a file instead, hold down the *Ctrl* key as you click-and-drag the selection to its destination. Note that when you drag file and folder selections to a different drive letter, they are always copied, *not* moved.

Screenshot

One of the cooler things you can do in Windows is grabbing a screenshot of the entire screen or one specific window. When you press the *Print Screen* (*Prnt Scrn*) key, everything you see on the screen, at the time, is captured as a picture and placed in the clipboard. If you press *Alt-Print Screen*, only the currently active window is copied to the clipboard.

Once you do that, you can paste the screenshot into any image editor, many text editors (not *Notepad*), or other programs, such as *PowerPoint*.

Note that oftentimes, you cannot use this technique to capture snapshots from your favorite DVD, currently playing on your computer.

Computer Terminology
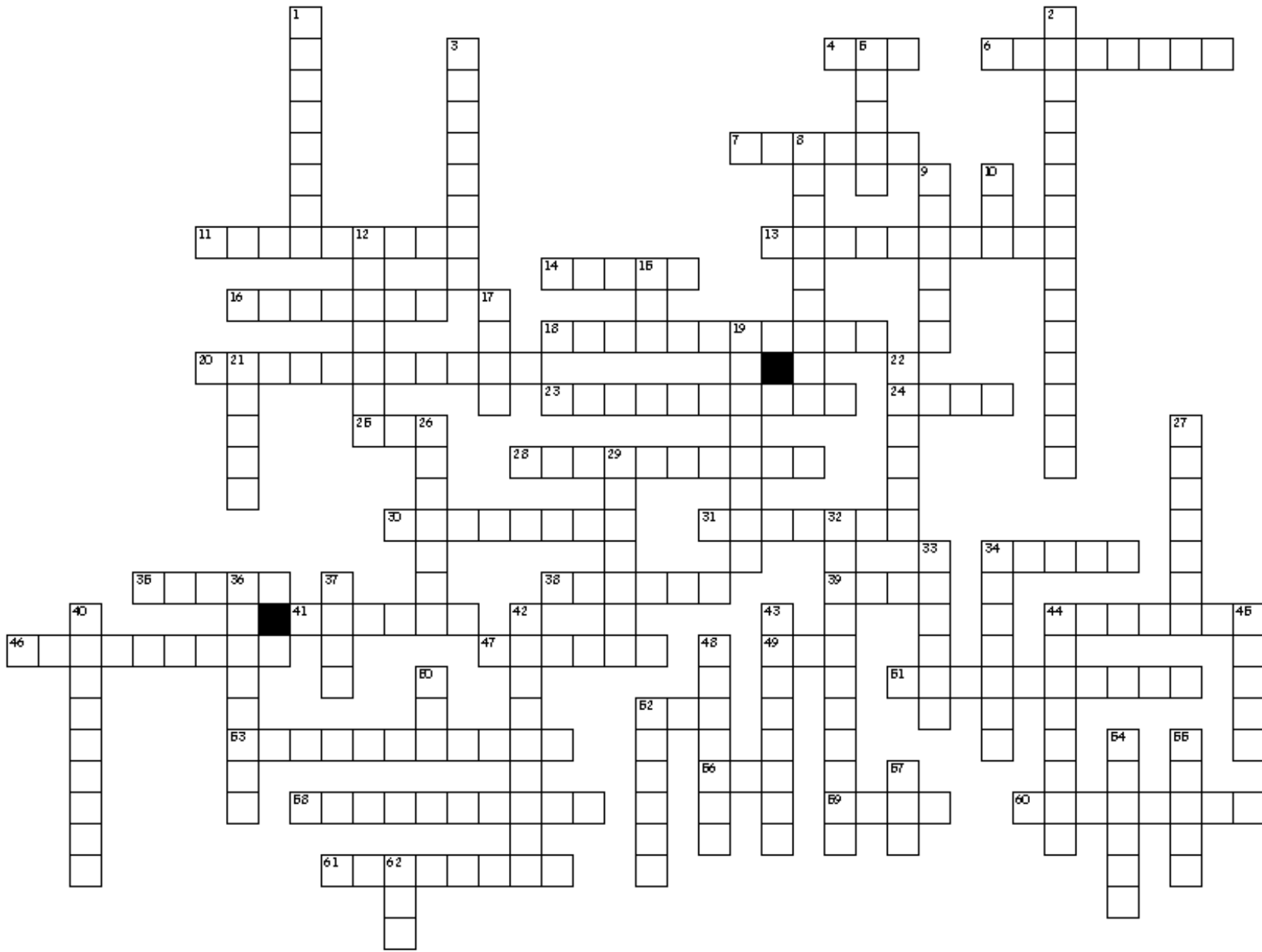
Across

4. The brain of a computer.
6. Allows you to type multiple upper-case characters.
7. Name of computer belonging to Bob and Larry.
11. Numbers used by the processor to access devices that are connected to it.
13. Environmentally conscious place where erased files go.
14. Program created to damage computers.
16. Common source of internet popups.
18. Quickly press a mouse button twice in a row.
20. Program that runs when your computer has been idle for a while, in order to avoid monitor burn-in.
23. Move all the data on disk together.
24. Small picture, representing a file or folder.
25. Storage that cannot be written over.
28. Portable storage, which replaced floppies.
30. Quit all applications and turn off computer.
31. Main working area in Windows or on a Mac.
34. Grants access to special characters, such as !, $, and *.
35. Where erased files go on a Mac.
38. Lossless digital image format.
39. Store data to a file.
41. Helps to keep your files organized.
44. Contains instructions that tell a computer what to do.
46. One or more objects or characters, chosen for clipboard operations.
47. Number system consisting of only zeroes and ones.
49. Space for storing temporary runtime data.
51. Image that appears on your desktop.
52. Text-based OS that preceeded Windows.
53. Usage of mathematical algorithms to reduce the size of a file.
56. Set of commands or functions that make it easier to do stuff, by taking care of the details.
58. Audio input device.
59. Make a change to existing data.
60. Primary text input device.
61. 1,048,576 8-bit blocks.

Down

1. Machine that processes data.
2. Software that allows a computer to control hardware, manage files, and execute programs.
3. Long-term file storage.
5. Use these to plug devices into your computer.
8. Part of a file name that indicates the type of data stored in it.
9. Remove a selection.
10. Color scheme used by computers.
12. Device for transferring data from paper to a computer.
15. Connectivity standard, used by many computer devices today.
17. Digital image format best used for photos.
19. Program that converts source code to binary instructions.
21. Press the mouse button.
22. Popular program that reduces the size of files.
26. The only language a computer can understand.
27. Transfers data from a computer to paper.
29. Visual output device.
32. Program that allows you to view and end programs that have stopped responding.
33. Method of sending data one bit at a time.
34. Audio output.
36. Link to the true location of a file or folder.
37. Computer starting up.
40. Used by copy, cut, and paste.
42. Maker of Windows and other programs.
43. Moving a selection on the screen.
44. Sending data, multiple bits at a time.
45. Pointing device for user input.
48. Put a new program on your computer, often from a CD-ROM.
50. Path of one or more wires that connect the processor to other devices inside the computer.
52. Program that lets Windows or another program control a device.
54. Restart a computer.
55. What a computer does when it gets very unhappy.
57. Smallest unit of data in a computer.
62. Digital image format well-suited for drawings and logos.