The Ultimate Guide To Computing

Computer Basic For Everyone

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By: Home And Learn.

Introduction

Are you new to using computers? Do you wonder what people mean when they say the cloud, Windows, ISP, or app? Perhaps you just want to know more about how computers work. When it comes to learning today's technology, our Computer Basics tutorial has all of the basic concepts covered.

Section One

Introduction to computer

What is a computer
Understanding operating systems Understanding applications Understanding the cloud

Chapter 1

What is a computer?

A **computer** is an electronic device that manipulates information, or data. It has the ability to **store**, **retrieve**, and **process** data. You probably already know that you can use a computer to **type documents**, **send email**, **play games**, and **browse the Web**. You can also use it to edit or create **spreadsheets**, **presentations**, and even **videos**.

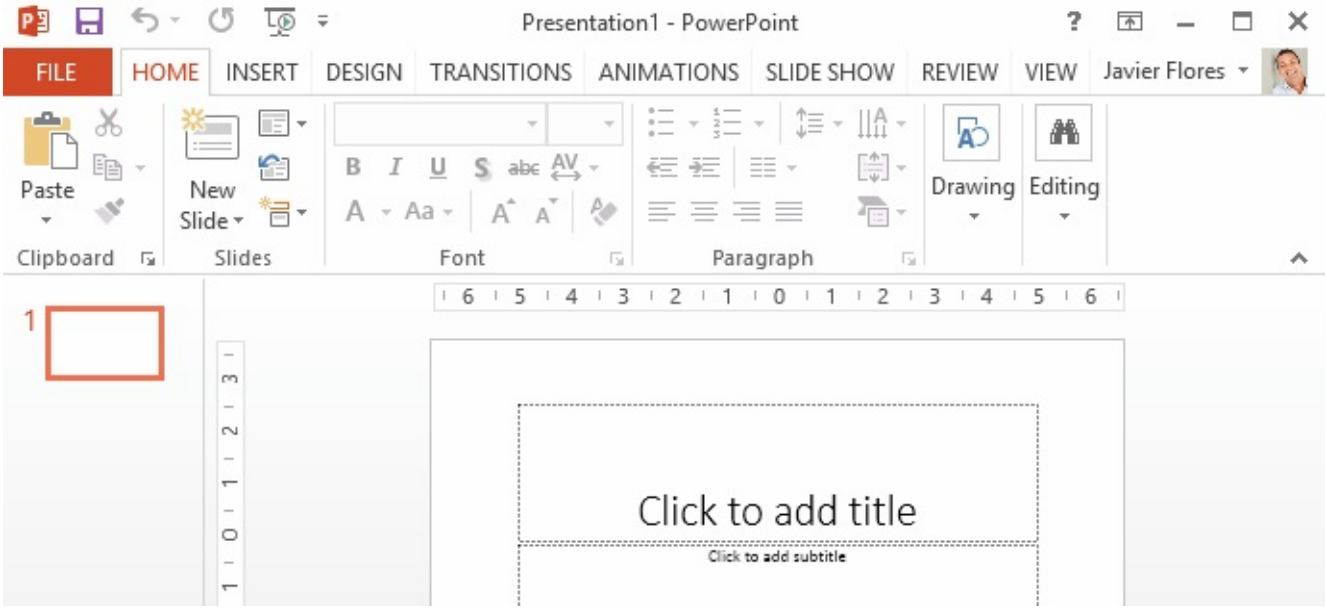
Watch the video to learn about different types of computers.

Throughout this tutorial, we'll show you some of the most important things you need to know about computers, including how to set up your computer, how to interact with the desktop and operating system, and what kinds of computers are available. We'll also introduce you to some basic troubleshooting strategies you can use if your computer isn't working correctly.

Hardware vs. software Before we talk about different types of computers, let's talk about two things all computers have in common: **hardware** and **software**.

Hardware is any part of your computer that has a **physical structure**, such as the keyboard or mouse. It also includes all of the computer's internal parts, which you can see in the image below.

Software is any **set of instructions** that tells the hardware what to do. It is what guides the hardware and tells it how to accomplish each task. Some examples of software include web browsers, games, and word processors. Below, you can see an image of Microsoft PowerPoint, which is used to create presentations.



Everything you do on your computer will rely on both hardware and software. For example, right now you may be viewing this lesson in a **web browser** (software) and using your **mouse**
(hardware) to click from page to page. As you learn about different types of computers, ask yourself about the differences in their hardware. As you progress through this tutorial, you'll see that different types of computers also often use different types of software.

What are the different types of computers?

When most people hear the word **computer**, they think of a **personal computer** such as a **desktop** or **laptop**. However, computers come in many shapes and sizes, and they perform many different functions in our daily lives. When you withdraw cash from an ATM, scan groceries at the store, or use a calculator, you're using a type of computer.

Desktop computers

Many people use **desktop computers** at work, home, school, or the library. They can be small, medium, or large in style, and they usually sit on a desk. Once you add a monitor, mouse, and keyboard, you have what is typically known as a desktop computer.

Most desktop computers are **easy to upgrade** and **expand** or add new parts. Another benefit of desktop computers is their **cost**. If you compare a **desktop** and **laptop** with the same features, you will most likely find that the desktop is less expensive.

Laptop computers

The second type of computer you may be familiar with is a **laptop computer**, or a laptop. Laptops are battery- or AC-powered personal computers that are **more portable** than desktop computers, allowing you to use them almost anywhere.

Because a laptop is smaller than a desktop, it’s more difficult to access its internal components. This means you may not be able to upgrade them as easily as a desktop.

Tablet computers

Tablet computers —or **tablets**—are handheld computers that are even more portable than laptops. Instead of a keyboard or touchpad, tablets use a **touch-sensitive screen** for typing and navigation. The **iPad** is an example of a tablet.

Tablets can’t necessarily do anything a laptop or a desktop can do, so you may still want a desktop or laptop to run programs or create documents. But if you just want to be able to play **games**, check **email** and **social media**, or **stream** music and videos, a tablet may be a good computer replacement.

Servers

A **server** is a computer that serves up information to other computers on a network. Many businesses have **file servers** employees can use to store and share files. A server can look like a regular desktop computer, or it can be much larger.

Servers also play an important role in making the Internet work: They are where **webpages** are stored. When you use your browser to click a link, a **web server** delivers the page you requested.

Other types of computers

Today, there are many everyday devices that are basically **specialized computers**, even though we don't always think of them as computers. Here are a few common examples:

Mobile phones: Many mobile phones can do a lot of things computers can do, such as browsing the Internet and playing games. These phones are often called **smartphones**.

Game consoles: A **game console** is a specialized kind of computer that is used for playing **video games**. Although they are not as fully featured as desktop computers, many newer consoles allow you to perform nongaming tasks like browsing the Web.

TVs: Many TVs now include **applications**—or **apps**—that let you access various types of online content. For example, you can view your **Facebook News Feed** or watch streaming movies on **Netflix**.

PCs and Macs Personal computers come in two main styles: **PC** and **Mac**. Both are fully functional, but they have a different look and feel, and many people prefer one or the other.

PC: This type of computer began with the original **IBM PC** that was introduced in 1981. Other companies began creating similar computers, which were called **IBM PC Compatible** (often shortened to **PC**). Today, this is the most common type of personal computer, and it typically includes the **Microsoft Windows** operating system.

Mac: The **Macintosh** computer was introduced in 1984, and it was the first widely sold personal computer with a graphical user interface, or **GUI** (pronounced **gooey**). All Macs are made by one company, **Apple Inc.**, and they almost always use the **Mac OS X** operating system.

About this tutorial

This tutorial is designed to introduce you to the **components** of computers and the **process** of beginning to use them. We'll talk about **operating systems**, **applications**, and **the cloud**, as well as **setting up** and **maintaining** your computer safely. These topics will be useful to you whether you have a PC or a Mac. However, once you've learned the basics, you may want to check out one of our operating system-specific tutorials: Windows Basics or OS X Basics.

Challenge!

Think about the **activities you perform** or want to perform using a computer (email, online shopping, etc.).
Think about all of the computers that are necessary for you to complete your **day-to-day activities**:

- Is it a computer that controls the stoplights so you can drive to work?
- How did the cashier scan and calculate your grocery items?
- Does the coffee store you visit use a computer to order its inventory?
- Is the weather map on television a computer-generated one?

Chapter 2

Understanding operating systems

What is an operating system?

An **operating system** is the **most important software** that runs on a computer. It manages the computer's **memory**, **processes**, and all of its **software** and **hardware**. It also allows you to **communicate** with the computer without knowing how to speak the computer's language. **Without an operating system, a computer is useless**.

Watch the video to learn about operating systems.

The operating system's job

Your computer's **operating system** (**OS**) manages all of the **software** and **hardware** on the computer. Most of the time, there are many different computer programs running at the same time, and they all need to access your computer's **central processing unit (CPU)**, **memory**, and **storage**. The operating system coordinates all of this to make sure each program gets what it needs.

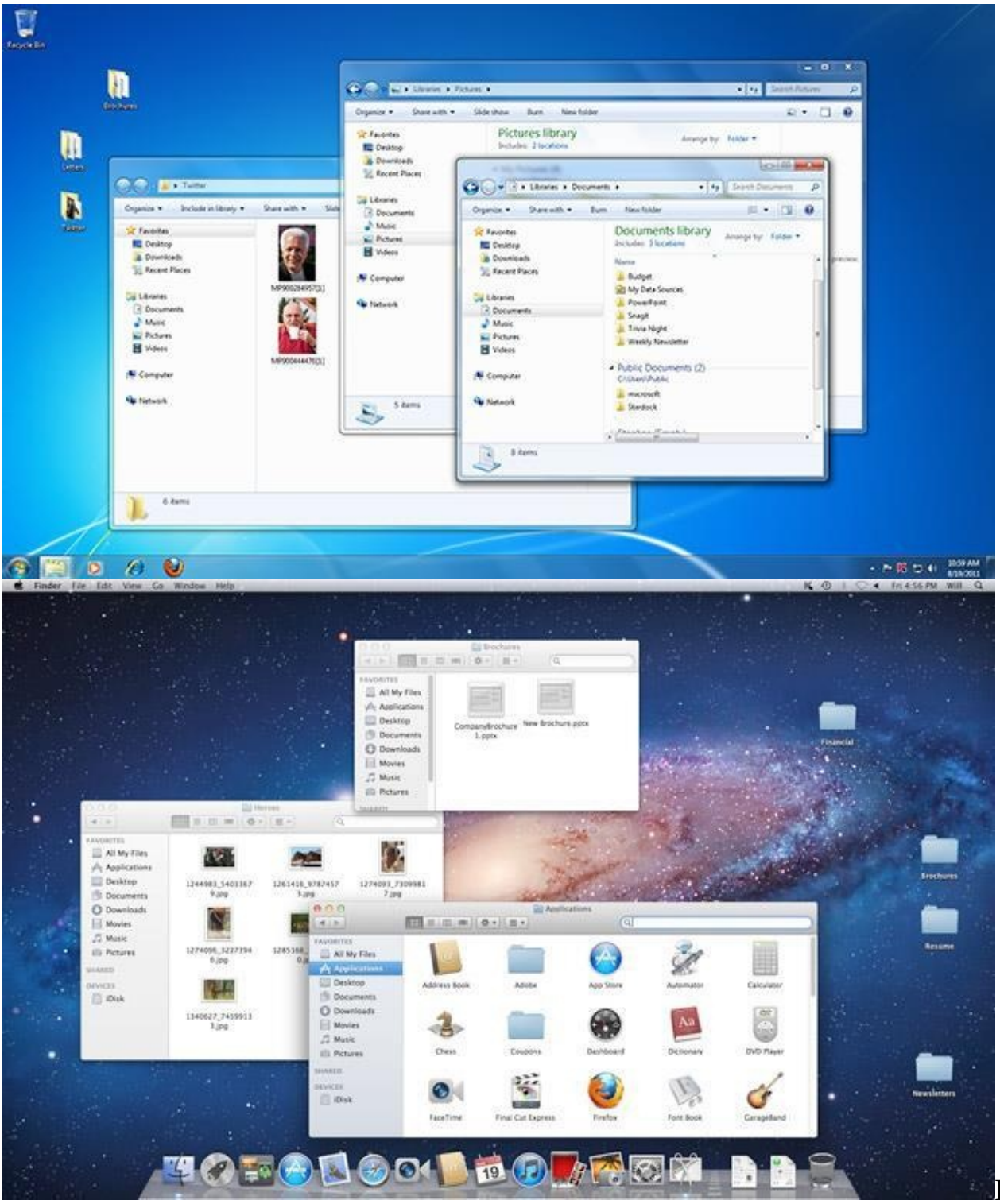
Types of operating systems

Operating systems usually come **preloaded** on any computer you buy. Most people use the operating system that comes with their computer, but it's possible to upgrade or even change operating systems.

The three most common operating systems for personal computers are **Microsoft Windows**, **Apple Mac OS X**, and **Linux**.

Modern operating systems use a **graphical user interface**, or **GUI** (pronounced **gooey**). A GUI lets you use your mouse to click **icons**, **buttons**, and **menus**, and everything is clearly displayed on the screen using a combination of **graphics** and **text**.

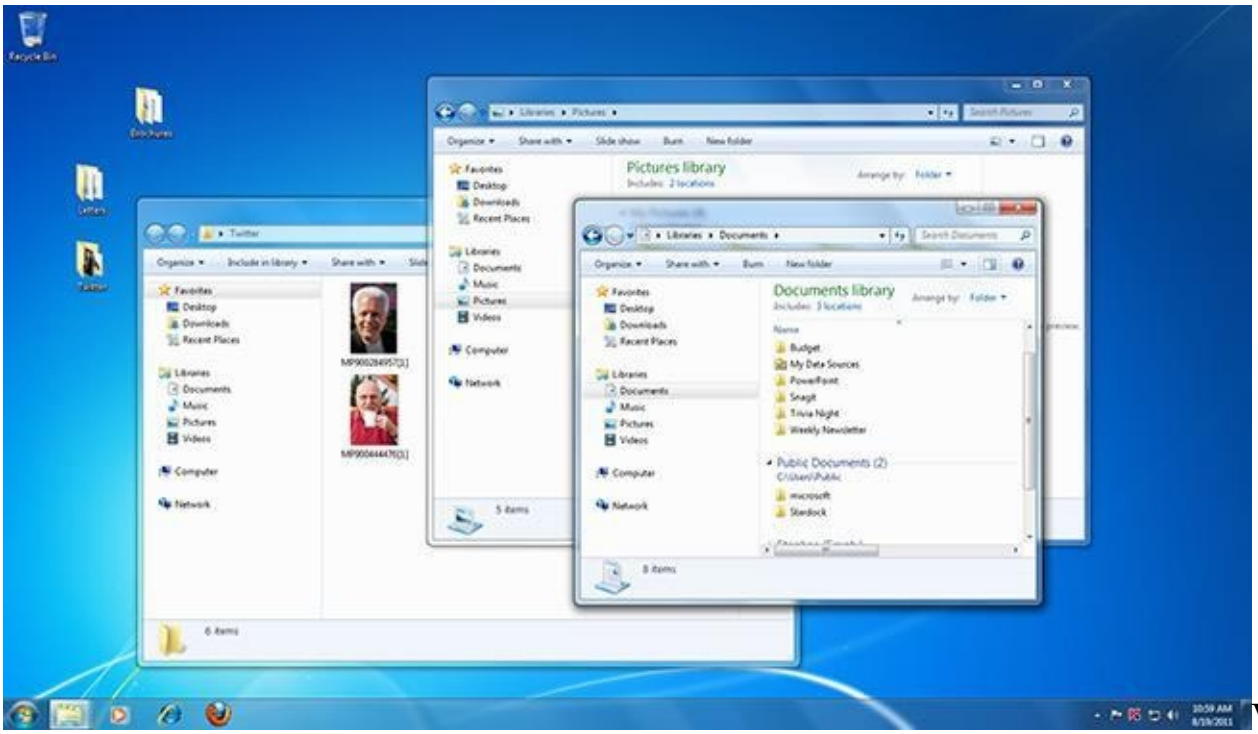
Each operating system's GUI has a different look and feel, so if you switch to a different operating system it may seem unfamiliar at first. However, modern operating systems are designed to be **easy to use**, and most of the basic principles are the same.



Before GUIs, computers had a **command-line interface**, which meant users had to type every single command to the computer and the computer would only display text.

Microsoft Windows

Microsoft created the **Windows** operating system in the mid-1980s. Over the years, there have been many different versions of Windows, but the most recent ones are **Windows 8** (released in 2012), **Windows 7** (2009), and **Windows Vista** (2007). Windows comes **preloaded** on most new PCs, which helps to make it the **most popular operating system** in the world. If you're buying a new computer or are upgrading to a newer version of Windows, you can choose from several different **editions** of Windows, such as **Home Premium**, **Professional**, and **Ultimate**. You may need to do some research to decide which edition is right for you.



Visit Microsoft's Windows page to learn more about this operating system.

Check out our tutorials on Windows 8, Windows 7, and Windows XP for more information. **Mac OS X**

Mac OS is a line of operating systems created by Apple. It comes preloaded on all new Macintosh computers, or Macs. All of the recent versions are known as **OS X** (pronounced O-S Ten), and the specific versions include **Yosemite** (released in 2014), **Mavericks** (2013), **Mountain Lion** (2012), **Lion** (2011), and **Snow Leopard** (2009). Apple also offers a version called **Mac OS X Server**, which is designed to be run on servers.

According to StatCounter Global Stats, Mac OS X users account for **9.5%** of the operating systems market as of September 2014—much lower than the percentage of Windows users (almost **90%**). One reason for this is that Apple computers tend to be more expensive. However, many people prefer the look and feel of Mac OS X.

Check out our tutorials on OS X Mavericks, Mountain Lion, and Lion for more information.

Linux

Linux (pronounced **LINN-ux**) is a family of **open-source** operating systems, which means they can be modified and distributed by anyone around the world. This is different from **proprietary software** like Windows, which can only be modified by the company that owns it (Microsoft). The advantages of Linux are that it is **free**, and there are many different **distributions**—or versions—you can choose from. Each distribution has a different look and feel, and the most popular ones include **Ubuntu**, **Mint**, and **Fedora**.

Linux is named after **Linus Torvalds**, who created the **Linux kernel** in 1991. The **kernel** is the computer code that is the central part of an operating system.

According to StatCounter Global Stats, Linux users account for less than **2%** of the operating systems market as of September 2014. However, most **servers** run Linux because it’s relatively easy to customize.

To learn more about different distributions of Linux, visit the Ubuntu, Mint, and Fedora websites. For a more comprehensive list, you can visit MakeUseOf's list of The Best Linux Distributions.

Operating systems for mobile devices

The operating systems we've been talking about were designed to run on **desktop** or **laptop** computers. **Mobile devices** such as **phones**, **tablet computers**, and **MP3 players** are different from desktop and laptop computers, so they run operating systems that are designed specifically for mobile devices. Examples of mobile operating systems include **Apple iOS**, **Windows Phone**, and **Google Android**. In the screenshot below, you can see Apple iOS running on an iPad.

Operating systems for mobile devices generally aren't as fully featured as those made for desktop and laptop computers, and they aren't able to run all of the same software. However, you can still do a lot of things with them, like watch movies, browse the Web, manage your calendar, and play games.

Challenge!

What is an **operating system**?
What **operating system** does your computer use?
Visit the Microsoft and Apple websites to learn more about each operating system.
Search the Internet for articles that **compare** Windows and Mac OS X.
Visit the Ubuntu, Mint, and Fedora websites to learn more about each Linux distribution.
If you have a **PC** and currently use an older version of Windows, such as Windows 7,

search for articles comparing **Windows 8.1** with **Windows 7**. You may want to read our lesson on Upgrading to Windows 8.1 to help you decide if you should upgrade. Computer Basic For Everyone

Chapter 3

Understanding applications

What is an application?

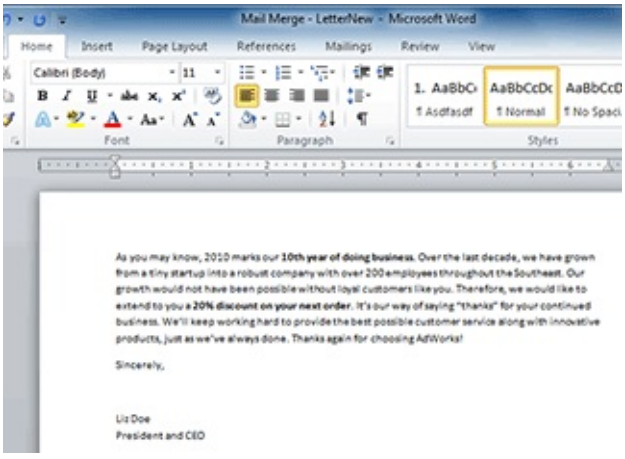
You may have heard people talking about using an **application** or an **app**. But what exactly does that mean? An **app** is a type of software that allows you to **perform specific tasks**. Applications for desktop or laptop computers are sometimes called **desktop applications**, and those for mobile devices are called **mobile apps**. When you open an application, it runs inside the **operating system** until you close it. Most of the time, you will have more than one application open at the same time, and this is known as **multitasking**.

Watch the video to learn about how applications are used.

App is a common term for an **application**, especially for **simple applications** that can be downloaded **inexpensively** or even **for free**. Many apps are also available for **mobile devices** and even some **TVs**.

Types of desktop applications

There are countless desktop applications out there, and they fall into many different categories. Some are more **full-featured** (like **Microsoft Word**), while others may only do **one or two things** (like **gadgets**). Below are just a few types of applications you might use:



Word processors: A word processor allows you to write a letter, design a flyer, and create many other types of documents. The most well-known word processor is **Microsoft Word**.

Personal finance: Personal finance software, such as **Quicken**, allows you to keep track of your income and expenses and create a budget, among other tasks. Most personal finance programs can automatically download information from your bank so you don't have to manually type in all of your transactions.

Web browsers: A **web browser** is the tool you use to access the **Internet**. Most computers come with a web browser **pre-installed**, but you can also download a different one if you prefer. Examples of browsers include **Internet Explorer**, **Firefox**, **Google Chrome**, and **Safari**.

Games: There are many different games you can play on your computer. They range from card games such as **Solitaire** to action games like **Halo 2**. Many action games require a lot of **computing power**, so they may not work unless you have a newer computer.

Media players: If you want to listen to **MP3s** or watch **movies** you've downloaded, you'll need to use a **media player**. **Windows Media Player** and **iTunes** are popular media players.

Gadgets: Sometimes called **widgets**, these are simple applications you can place on your desktop (or on the **Dashboard** if you're using a Mac). There are many different types of gadgets, and they include **calendars**, **calculators**, **maps**, and **news headlines**.

Installing applications

In order to work, an application usually has to be **installed** on your computer. Typically, installation is as simple as inserting the **installation disc** and following the instructions on the screen. For software **downloaded from the Internet**, you can usually **double-click** it after it is finished downloading and then follow the instructions on the screen. Many applications include a **readme** file (for example, **readme.txt**), which includes installation instructions and other information.

Use caution when downloading software because it can contain **viruses** or other **malware**. If you have an **antivirus** program, you should scan the downloaded software before installing it. For more information, learn about Protecting Your Computer from Internet Threats in our Internet Safety tutorial.

Files and applications

Each application on your computer has a group of **file types**—or **formats**—it is able to open. You generally won't have to figure out which application will open your files. When you **double-click** a file, your computer will automatically use the correct application to open it, as long as the application is installed on your computer.

If you don't have the correct application installed, you may not be able to open the file. However, in some cases you can open the file with a **web application** that runs in your browser. For example, if you don't have Microsoft Word, you can open Word documents with **Google Docs**. To learn more, you can visit our lesson on Understanding the Cloud.

If you're not sure what a file's **format** is, you can look at the **extension** at the end of the file name (such as **.docx**, **.txt**, or **.jpg**). On some computers, the extension may be **hidden**, and you may need to look at the **icon** to determine the file format.

Mobile apps

Desktop and laptop computers aren't the only devices that can run apps. You can also download apps for mobile devices like **smartphones** and **tablets**, which opens up many new possibilities. Here are a few examples of mobile apps:

Flipboard: Flipboard allows you to create a **personal news feed** by choosing topics, authors, and publications you like. The app will keep track of what you like and deliver content that interests you. You can even create your own **online magazine** for other Flipboard users to read.

Wolfram|Alpha: Wolfram|Alpha is basically a giant searchable **encyclopedia** for any kind of science, language, or math question you might have. You can access Wolfram|Alpha on the Web or download the app for your mobile device, and the company makes specific **reference apps** for different subjects as well. But the basic Wolfram|Alpha app will give you access to data on the greatest number of subjects from your tablet or phone.

TuneIn Radio: TuneIn Radio allows you to **stream** talk radio, music, and **podcasts** from around the world. It can be downloaded on your computer as well as to your phone or tablet, so you can listen to whatever interests you anywhere you have **Internet access**.

Compared with traditional applications, mobile apps are **relatively inexpensive**. Some of

them cost as little as **$0.99** and others are **free**, although they may require you to make **in-app purchases** to access some functions. If your mobile device has an Internet connection, you can download apps directly onto it. Otherwise, you can sometimes download them to your computer and then transfer them over.

GCFLearnFree.org offers a variety of **educational mobile apps**. You can go to our Mobile Apps page to download them for free.

Challenge!

What are some **examples of applications** you have on your computer? Did you have to **install** them, or did they come **pre-installed** on your computer?

Try **double-clicking some files** on your computer. Which applications open up?

What are some **examples of mobile apps**?

If you have a mobile device, research some of the apps available for Apple iOS or Android.

Chapter 4

Understanding the cloud

What is the cloud?

You may have heard people using terms like **the cloud**, **cloud computing**, or **cloud storage**. But what exactly is the cloud? Basically, the cloud is **the Internet**—more specifically, it's all of the things you can **access remotely** over the Internet. When something is **in the cloud**, it means it is stored on **servers** on the Internet instead of on your computer. It lets you access your **calendar**, **email**, **files**, and **more** from any computer that has an Internet connection.

Watch the video to learn about the cloud.

If you've ever used web-based email, you've used the cloud. All of the emails in your inbox are stored on servers. However, there are many other services that use the cloud in different ways. Here are just a few examples:

Dropbox is a cloud storage service that lets you easily store and share files with others, and it lets you access your files from a mobile device as well.

Evernote lets you type notes, clip webpages, take photos, and organize all of them from your computer or mobile device.

Mozy and Carbonite can automatically back up your data in case your computer is lost, stolen, or damaged.

There are also apps you can use that live in the cloud so you can use them without installing them on your computer. These apps are sometimes called **web apps**. Web apps include things like **Google Docs**, which allows you to create documents and spreadsheets online; and **Runescape**, which is a game you can play in your browser without

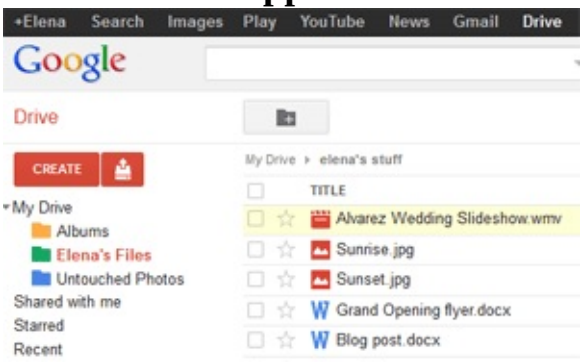
downloading anything.

Why use the cloud?

There are many reasons to use the cloud, but the main reasons are **convenience** and **reliability**. Saving a file to the cloud ensures that you'll be able to access it with any computer that has an Internet connection, so you won't need to worry about using **CD-ROMs** or **USB flash drives**. The cloud also makes it much easier to **share** a file with coworkers and friends.

With the cloud, you're much less likely to **lose your data** because it is stored on servers. However, just like anything online, there is always a risk that someone may try to **gain access to your personal data**, so it's important to choose a **strong password** and pay attention to any **privacy settings** for the service you're using.

What is a web app?



Previously, we talked about how **desktop applications** allow you to perform tasks on your computer. However, there are also **web applications**—or **web apps**—which run **in the cloud** and do not need to be installed on your computer. These are sometimes called **cloud apps**.

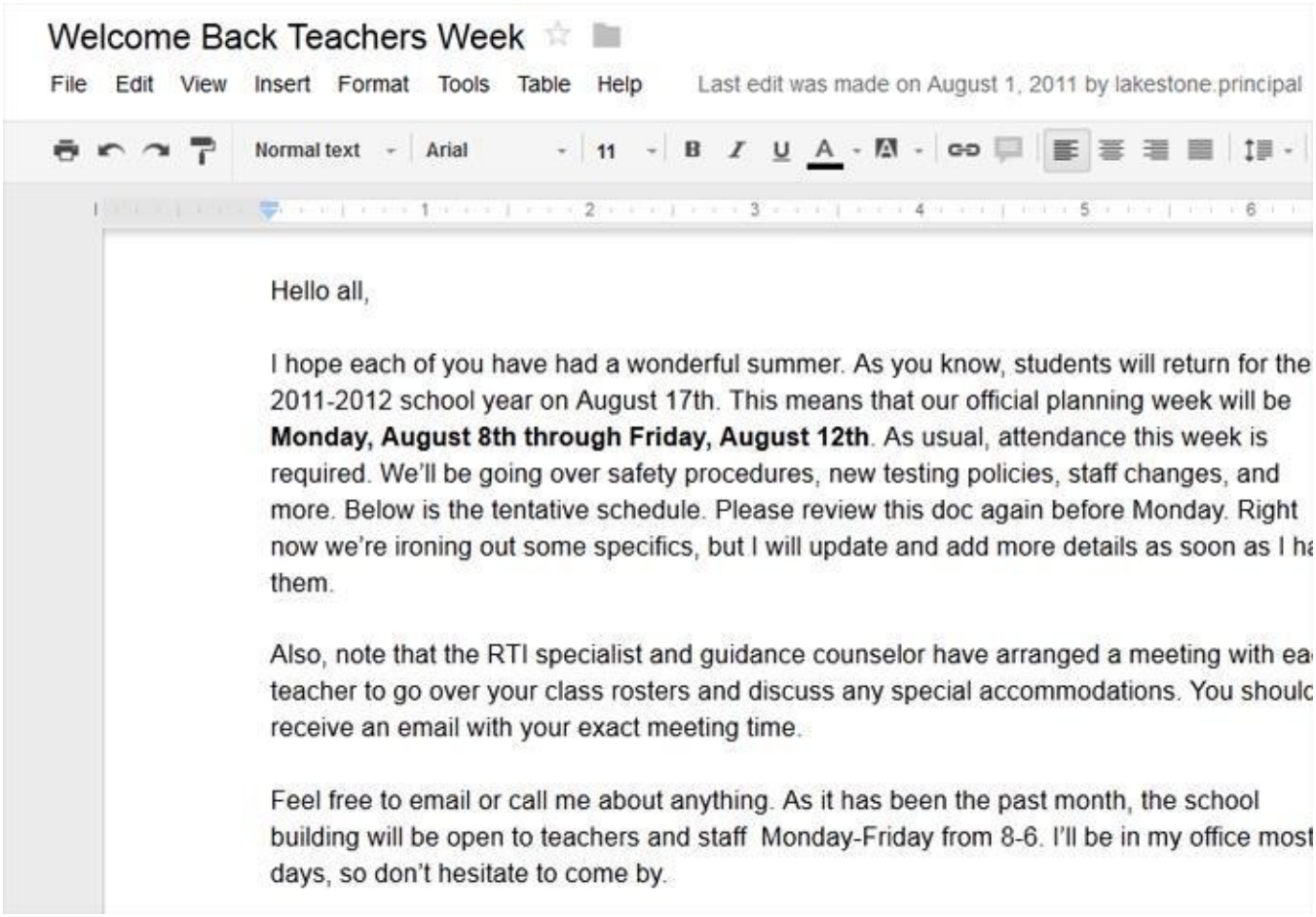
Examples of web apps

Many of the most popular sites on the Internet are actually web apps. You may have even used a web app without realizing it! Here are just a few examples:

Online email services: Services like **Gmail** and **Yahoo! Mail** run within your browser and can do many of the same things email programs like **Microsoft Outlook** can do. After you sign up for an online email service, you can begin using it immediately—no installation is required. Instead of being stored on your computer, your emails are stored **in the cloud**.

Facebook: Facebook lets you create an online **profile** and interact with your **friends**. Profiles and conversations are **constantly evolving**, so Facebook uses web app technologies throughout the site to **keep the information up to date**. There are also **games** and other **web apps** you can add to your Facebook profile.

Google Docs: Google Docs (shown below) is an **office suite** that runs in your browser. Much like **Microsoft Office**, you can use it to create **documents**, **spreadsheets**, **presentations**, and more. Your documents are stored **in the cloud**, which makes it easy to **share** them with others.



Challenge!

What is **the cloud**?
Do you use any apps or websites now that you think are **cloud-based**?
What are some **other ways** you could use the cloud?
How is a **web app** different from a **desktop application**?

Section 2

Hardware basic

Basic part of a computer
Buttons and ports of a computer. Inside a computer.

Chapter 5

Basic part of a computer.

Introduction

The basic parts of a desktop computer are the **computer case**, **monitor**, **keyboard**, **mouse**, and **power cord**. Each part plays an **important role** whenever you use a computer.
Watch the video to learn about the basic parts of a desktop computer.

Computer case

The **computer case** is the metal and plastic box that **contains the main components** of the computer. It houses the motherboard, central processing unit (CPU), power supply, and more.

Computer cases come in different shapes and sizes. A **desktop case** lies flat on a desk, and the monitor usually sits on top of it. A **tower case** is tall and sits next to the monitor or on the floor. The front of the case usually has an **on/off switch** and **one or more optical drives**.

Most of the personal computers you can purchase today include **tower cases** rather than desktop cases; however, some computers are being made with all of the internal components built into the monitor, which eliminates the need for a tower.

Monitor

The **monitor** works with a **video card**, located inside the computer case, to display images and text on the screen. Newer monitors usually have **LCD** (liquid crystal display) or **LED** (lightemitting diode) displays. These can be made very thin, and they are often called **flat-panel displays**. Older monitors use **CRT** (cathode ray tube) displays. CRT monitors are much larger and heavier, and they take up more desk space.

Most monitors have **control buttons** that allow you to change your monitor's display settings, and some monitors also have built-in speakers.
LED displays are actually **LCDs** that are **backlit** with light-emitting diodes. This allows for **greater contrast** than a traditional LCD.

Power cord

The power cord is the **link** between the **power outlet** and the **power supply unit** in the computer casing. If the power cord is not plugged in, the computer will not power on. To protect your computer from voltage spikes, you can plug the power cord in to a **surge protector**. You can also use an **uninterruptable power supply (UPS)**, which acts as a surge protector and provides temporary power if there is a blackout.

Keyboard

The **keyboard** is one of the primary ways we communicate with the computer and enter data. There are many different types of computer keyboards, including wired, wireless, ergonomic, and multimedia. Although there may be differences in the location of some keys or features, keyboards are **very similar** and allow you to accomplish basically the same tasks.

Click the buttons in the interactive below to learn about the different parts of the keyboard.

If you want to learn how to type or improve your touch-typing skills, check out our free Typing Tutorial.

Mouse

The **mouse** is a **peripheral** that is known as a **pointing device**. It lets you **point** to objects on the screen, **click** on them, and **move** them.

There are two main types of mice: optical and mechanical. The **optical** mouse uses an electronic eye to detect movement and is easier to clean. The **mechanical mouse** uses a rolling ball to detect movement. Generally, a mechanical mouse is less expensive, although it may require regular cleaning to keep it working properly.

Traditionally, a mouse connects to the computer using a **USB** or **PS/2** connection. However, you can also buy a **wireless** mouse, which can reduce clutter on your desktop.

To learn the basics of using a mouse, check out our interactive Mouse Tutorial.

Mouse alternatives

There are other devices that can do the same thing as a mouse but that have a different look and feel. Many people find them to be easier to use, and they also require less desk space than a mouse. The most common mouse alternatives include:

Trackball: A trackball has a ball on top that can rotate freely. Instead of moving the device like a mouse, you can roll the ball with your fingers to move the pointer. Some mobile devices have miniature trackballs that can be controlled with your thumb.

Touchpad: A touchpad—also called a **trackpad**—is a touch-sensitive pad that lets you control the pointer by making a drawing motion with your finger. Touchpads are common on laptop computers.

Challenge!

Think about the **desktop computers** you've seen at work, school, the library, a store, or a friend's house. What did they look like? Were they **all-in-one**, or did they have a separate **tower**?

Review the **keyboard** interactive on page 3 of this lesson. Are there any keys you haven't used before?

If you're using a **mouse**, flip it over to see whether it's **optical** or **mechanical**.

Is your monitor **LCD**, **LED**, or **CRT**?

If your monitor has **control buttons**, try adjusting the **brightness** and **contrast**.

CHAPTER 6

Buttons and Ports on a Computer

Introduction

Take a look at the front and back of your computer case, and count the number of **buttons**, **sockets**, and **slots** you see. Now look at your monitor and count any that appear there. You probably counted at least 20.

Each computer is different, so the buttons, slots, and sockets will **vary from computer to computer**. However, there are certain features you can expect to find on most desktop computers. Being familiar with the names of each and how they are commonly used will help you later on when you connect a new printer, mouse, digital camera, or other device.

Watch the video to learn about the buttons, sockets, and slots on a desktop computer.

Front of computer case

Click the buttons in the interactive below to become familiar with the front of a computer.

Back of computer case

On the back of the computer case are **connection ports** that are made to fit **specific devices**. The arrangement of these varies from computer to computer, and many companies have their own special connectors for specific devices. Some of the ports may be **color coded** to match a color on the device, which will help you determine which port is used with a particular device.

Click the buttons in the interactive below to become familiar with connection ports.

Other types of ports

There are many other types of ports computers can have. For example, some Macs have a **FireWire** port, which is similar to USB. There are also newer ports such as **Thunderbolt**, which can transmit data at very high speeds, making them ideal for use with **high-resolution monitors** and **external hard drives**. If your computer has ports you don't recognize, consult your manual for more information.

Peripherals you can use with your computer

The most basic computer setup usually includes the **computer case**, **monitor**, **keyboard**, and **mouse**, but you can plug many different types of devices into the extra ports on your computer. These devices are called **peripherals**. Below are a few examples of peripherals.

Printers: A **printer** is used to **print** documents, photos, and anything else that appears on your screen. There are many types of printers available, including **inkjet**, **laser**, and **photo** printers. You can also buy an all-in-one printer, scanner, and copier.

Scanners: A **scanner** allows you to **copy an image or document** and save it to your computer as a **digital (computer-readable)** image. Many scanners are included as part of an all-in-one printer, scanner, and copier, although you can also buy a separate **flatbed** or **handheld** scanner.

Speakers/headphones: Speakers and **headphones** are output devices, which means they are devices that communicate information from the computer to the user. They allow you to **hear sound and music**. Depending on the model, they may connect to the **audio** port or the **USB** port. Some monitors also have built-in speakers.

Microphones: A **microphone** is a type of input device, or a device that receives information from a user. You can connect the microphone to the computer and use the computer to record sound or to communicate with another computer user over the Internet. Many computers come with built-in microphones.

Web cameras: A **web camera**—or **webcam**—is a type of input device that can record **videos** and take **pictures**. It can also transmit video over the Internet in **real time**, allowing you to do **video chat** or **video conferencing** with someone in a different part of the world. Webcams are used often in business, and they also help many friends and families stay connected.

Joystick or game controller: A **joystick** is a lever that is used to control computer games. There are many other types of controllers you can use, and you can also use your **mouse** and **keyboard** to control most games.

Digital cameras: A **digital camera** lets you capture a picture or video in digital form. By connecting the camera to your computer's USB port, you can transfer the images from the camera to the computer. You can then **print** the images, **email** them to a friend, or **post** them on the Web.

Mobile phones, MP3 players, tablet computers, and other devices: When you buy an electronic device such as a mobile phone or MP3 player, check to see if it comes with a **USB cable**. If it does, this means you can connect it to your computer. With many devices, you can **synchronize**—or **sync**—them with your computer, which automatically keeps your contacts, music, and other data up to date whenever you connect the device to your computer.

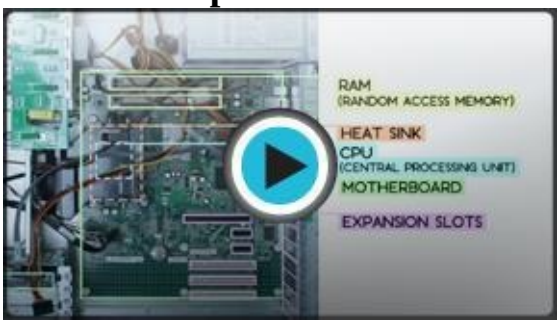
Challenge!

Find out what types of **drives** are on your computer (CD-ROM, DVD-ROM, etc.). Count the number of **USB ports** on your computer.
What are some of the **peripherals** you can use with your computer?
Does your **mobile phone** include an adapter cable that connects to your computer?

CHAPTER 7

Chapter 7

Inside a computer



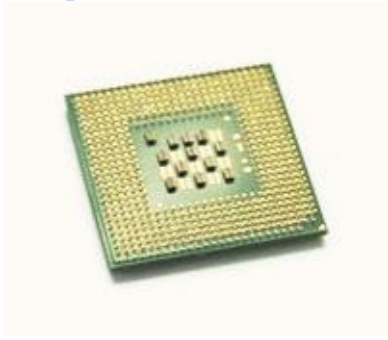
Have you ever looked **inside a computer case** before, or seen pictures of the inside of one? The small parts may look complicated, but the inside of a computer case really isn't all that mysterious. This lesson will help you master some of the basic **terminology** and understand a bit more about what goes on inside a computer casing.

Watch the video to learn about what's inside a desktop computer.

A look inside a computer

Let's explore the inside of a computer tower.

CPU/processor



The central processing unit (CPU), also called a **processor**, is located inside the **computer case** on the motherboard. It is sometimes called the brain of the computer, and its job is to carry out commands. Whenever you press a key, click the mouse, or start an application, you're sending instructions to the CPU.

The CPU is generally a **two-inch ceramic square** with a **silicon chip** located inside. The chip is usually about the size of a thumbnail. The CPU fits into the motherboard's **CPU socket**, which is covered by the **heat sink**, an object that absorbs heat from the CPU.
A processor's **speed** is measured in **megahertz (MHz)**, or millions of instructions per second; and **gigahertz (GHz)**, or billions of instructions per second. A faster processor can execute instructions more quickly. However, the actual speed of the computer depends on the speed of many different components—not just the processor.

There are many processor manufacturers for personal computers, but the most well-known ones are **Intel** and **AMD**.

Motherboard

The **motherboard** is the computer's **main circuit board**. It's a thin plate that holds the CPU, memory, connectors for the hard drive and optical drives, expansion cards to control the video and audio, and connections to your computer's ports (such as USB ports). The motherboard connects directly or indirectly to every part of the computer.

Power supply unit

The power supply unit in a computer **converts the power** from the wall outlet to the type of power needed by the computer. It sends power through cables to the motherboard and other components.

If you decide to open the computer case and take a look, make sure to **unplug** the computer first. Before touching the inside of the computer, you should touch a grounded metal object—or a metal part of the computer casing—to discharge any static buildup. Static electricity can be transmitted through the computer circuits and ruin them.

RAM (random access memory)

RAM is your system's **short-term memory**. Whenever your computer performs calculations, it temporarily stores the data in the RAM until it is needed.

This **short-term memory disappears** when the computer is turned off. If you're working on a document, spreadsheet, or other type of file, you'll need to **save** it to avoid losing it.

When you save a file, the data is written to the **hard drive**, which acts as **long-term storage**.

RAM is measured in **megabytes (MB) or gigabytes (GB)**. The **more RAM** you have, the more things your computer can do at the same time. If you don't have enough RAM, you may notice that your computer is sluggish when you have several programs open. Because of this, many people add **extra RAM** to their computers to improve performance.

Hard drive

The **hard drive** on your computer is where the software is installed, and it's also where your documents and other files are stored. The hard drive is **long-term storage**, which means the data is still saved even if you turn the computer off or unplug it.
When you run a program or open a file, the computer copies some of the data from the **hard drive** onto the **RAM**. When you **save** a file, the data is copied back to the **hard drive**. The faster the hard drive is, the faster your computer can **start up** and **load programs**.

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Challenge!

Review the **parts of the computer** identified in this lesson. Make sure you know the function of each part.

Think creatively! In the videos, we compared the CPU to a brain, the hard drive to a closet, and the motherboard to a blueprint. Do any of the computer parts listed remind you of anything else?

Find out your computer's **processor speed**. Is it measured in **gigahertz** or **megahertz**? How much **RAM** does your computer have?

Section 3
Laptops and mobile devices.

Laptop computers.
Mobile devices.

Chapter 8 Laptop computers.

What is a laptop computer?

A laptop is a personal computer that can be **easily carried** and used in a variety of locations. Many laptops are designed to have all of the functionality of a desktop computer, which means they can generally run the same **software** and open the same types of **files**. However, some laptops, such as **netbooks**, sacrifice some functionality in order to be **even more portable**.

Watch the video to learn about the basic parts of a laptop computer.

How is a laptop different from a desktop?

Because laptops are designed for portability, there are some important differences between them and desktop computers. A laptop has an **all-in-one design**, with a built-in **monitor**, **keyboard**, **touchpad** (which replaces the mouse), and **speakers**. This means it is fully functional, even when there are no peripherals attached to it. A laptop is quicker to set up, and there are fewer cables to get in the way. Some newer laptops even have touchscreens, so you may not even need to use a keyboard or mouse.

There also is the option of connecting a regular mouse, larger monitor, and other peripherals. This basically **turns your laptop into a desktop computer**, with one main difference: You can easily disconnect the peripherals and take the laptop with you wherever you go.

Here are the main differences you can expect with a laptop.

Touchpad: A touchpad—also called a **trackpad**—is a touch-sensitive pad that lets you control the pointer by making a drawing motion with your finger. Many touchpads now include **multi-touch gestures**, which allow you to perform **specific tasks** by making gestures with more than one finger. For example, a **pinch** gesture is often used to zoom in

or out.

Battery: Every laptop has a battery, which allows you to use the laptop when it's not plugged in. Whenever you plug in the laptop, the battery **recharges**. Another benefit of having a battery is that it can provide **backup power** to the laptop if the power goes out.

AC adapter: A laptop usually has a specialized power cable called an **AC adapter**, which is designed to be used with that specific type of laptop. Some of these cables use magnetic **MagSafe** connectors that will safely pull out if someone trips over the power cable. This helps to prevent damage to the cable and the laptop.

Ports: Most laptops have the same types of ports desktop computers have (such as **USB**), although they usually have **fewer ports** to save space. However, some ports may be different, and you may need an adapter in order to use them. For example, the monitor port is often a **Mini DisplayPort**, which is a smaller version of the normal **DisplayPort**.

Because some ports have a similar appearance, you may need to look at your **manual** to determine what types of ports your laptop has.

Challenge!

If you've used a laptop before, think about some of the ways it was different from a desktop computer. Was it easier or more difficult to use?

What are some advantages to using a laptop or netbook? Are there any disadvantages?

If you are thinking about buying a laptop, think about how you would use it. Are there any **parks**, **coffee shops**, or **bookstores** where you could use your laptop?

Would a **laptop**, **netbook**, or **tablet computer** work best for you?

Chapter 9 Mobile devices.

What is a mobile device?

A mobile device is basically any **handheld computer**. It is designed to be extremely portable, often fitting in the palm of your hand or in your pocket. Some mobile devices are more powerful, and they allow you to do many of the same things you can do with a desktop or laptop computer. These include **tablet computers**, **e-readers**, and **smartphones**.

Tablet computers

Like **laptops**, **tablet computers** are designed to be portable. However, they provide a different computing experience. The most obvious difference is that tablet computers don't have keyboards or touchpads. Instead, the entire screen is touch-sensitive, allowing you to type on a **virtual keyboard** and use your finger as a mouse pointer.

Tablet computers can't necessarily do everything traditional computers can do. For many people, a traditional computer like a **desktop** or **laptop** is still needed in order to use some programs. However, the convenience of a tablet computer means it may be ideal as a **second computer**. Below are some of the main features you can expect with a tablet computer.

Mobile OS: Different types of tablets use different operating systems. Examples include **Android** and **iOS**. You'll usually be able to download **free updates** to your OS as they become available.

Solid-state drives: Tablet computers usually use **solid-state drives**, which allow the

computer to **boot up** and open **programs** more quickly. They are also more **durable** than hard disk drives.

Wi-Fi and 3G/4G: Because they are optimized for Internet use, tablet computers have built-in **Wi-Fi**. For a monthly fee, you can also purchase a **3G or 4G data plan**, allowing you to access the Internet from almost anywhere.

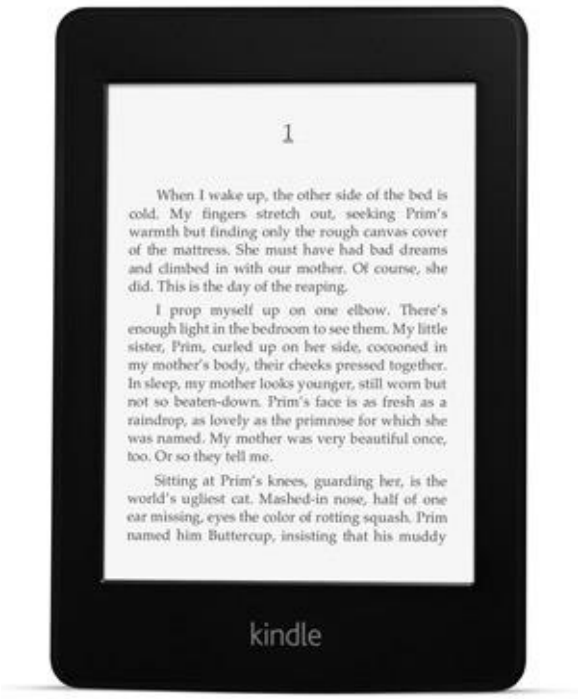
Bluetooth: In order to save space, tablet computers have very few **ports**. If you want to use an external **keyboard** or other peripherals, they will often use a wireless **Bluetooth** connection.

E-Book readers

E-book readers —also called **e-readers**—are similar to tablet computers, except they are mainly designed for reading **e-books** (digital, downloadable books). Examples include the **Amazon Kindle** and the **Barnes & Noble Nook**.

E-book readers have either an **e-paper** display or an **LCD** display.

E-Paper: Short for **electronic paper**, this type of display can usually only display **black and white**. It is designed to look a lot like an actual page in a book. Unlike an LCD display, it is **not backlit**, so the text stays readable even if you're outdoors in full sun. Many people consider e-paper to be more pleasant to read because it causes less **eye strain**. However, it generally can't be used for **videos** or other applications because the refresh rate is too low.



LCD: This is the same type of screen found on **tablet computers** and **laptops**. It's more versatile than e-paper, but it's often more difficult to view in bright sunlight because the image becomes **washed out**. Because an LCD screen can display **colors**, this type of ereader is better for viewing **magazines** and books with **photos**. Many LCD e-readers (such as the **Nook Color**) are basically **tablet computers** because they can perform many different tasks in addition to displaying e-books.

You don’t need an e-reader to read an e-book. E-books can usually be read on **tablet computers**, **smartphones**, **laptops**, and **desktops**.
Go to the Kindle and Nook websites to compare the features of different e-readers.

Smartphones

A **smartphone** is a powerful **mobile phone** that is designed to run a variety of applications in addition to providing phone service. Smartphones are basically small **tablet computers**, and they can be used for **web browsing**, **watching videos**, **reading e-books**, and **playing games**.

Smartphones use **touchscreens** and **operating systems** similar to those used by tablet computers. Many of them use a **virtual keyboard**, but others have a **physical keyboard**, which allows the entire screen to be used for display purposes.

Internet access is an important feature of smartphones. Generally, you will need to purchase a **3G, 4G, or LTE data plan** in addition to normal **cell service**. Smartphones can also connect to **Wi-Fi** when it is available; this allows you to use the Internet without using up your monthly data allotment.

3G , **4G**, and **LTE**—sometimes called **4G LTE**—are different types of **networks** for cell phones.
3G is the slowest of the three networks, but it is also the most widely used. 4G has the potential to be much faster than 3G, but most phones are not yet **equipped** to use it. 4G networks are also not available everywhere—you're more likely to be able to use one if you live in a **big city**. LTE is the most recent version of 4G. As more phones become **4G compatible**, the number of people who use 4G and LTE networks will likely grow.

Challenge!

Think about how a **tablet computer** is different from a **laptop**. What are some advantages and disadvantages to using a tablet?
If you're thinking about buying an **e-reader**, think about what types of things you like to read. Do you mostly read **books** or **magazines**? What type of screen do you think would be best?
Smartphones can have **virtual keyboards** or **physical keyboards**. What are some advantages and disadvantages to each one?

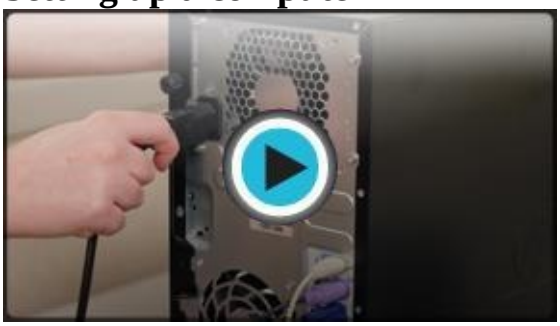
Section 4 Using a Computer

Setting up a computer
Beginning to use your computer. Getting to know the OS.
Connecting to the internet.

Chapter 10

Setting up a computer

Setting up a computer



You have a **new computer** and are ready to set it up. While this may seem like an overwhelming and difficult task, it is actually quite simple. It doesn't matter what brand of computer you have because most computers are set up in a similar way.

If you're setting up a newly purchased computer that's still in the box, you'll probably find a **how-to guide** in the packaging that includes **step-by-step details**. However, even if it didn't include instructions you can still set up the computer in a **few easy steps**. In this lesson, we'll go through the different steps needed to set up a typical computer.

Watch the video to learn how to set up a desktop computer.

Setting up a laptop computer

If you have a laptop, setup should be easy: Just open it and press the power button. If the battery isn't charged, you'll need to plug in the **AC adapter**. You can continue using the laptop while it charges.

If your laptop has any **peripherals**, like **external speakers**, you may want to read the instructions below because laptops and desktops generally use the same types of connections.

Setting up a desktop computer

Step 1

Unpack the **monitor** and **computer case** from the box. Remove any plastic covering or protective tape. Place the monitor and computer case where you want on a desk or work area.

Think about where you want your desk or work area to be located, and where you want your monitor, computer case, and other hardware to be. Be sure to place your computer case in an area that is **well ventilated** and that has good air flow. This will help to prevent overheating.

Step 2

Locate the **monitor cable**. There are several types of monitor cables, so the one on your computer may not look like the one in the image at the left. If you're having trouble finding your monitor cable, refer to the instruction manual for your computer. (If you have an **all-in-one** computer that's built into the monitor, you can skip to **Step 4**).
Connect one end of the cable to the **monitor port** on the back of the **computer case** and the other end to the **monitor**. Hand tighten the plastic-covered screws on the monitor cable to secure it.

Many computer cables will only fit a specific way. If the cable doesn't fit, don't force it or you might damage the connectors. Make sure the plug aligns with the port, then connect it. To figure out which cables belong in which ports, try our Connecting Cables interactive.

Step 7

Locate the two **power supply cables** that came with your computer. Plug the first power supply cable into the back of the **computer case**, and then into a **surge protector**. Then, using the other cable, connect the **monitor** to the **surge protector**.

Finally, plug the **surge protector** into a wall outlet. You may also need to turn on the **surge protector** if it has a power switch.
If you don't have a surge protector, you can plug the computer directly into the wall. However, this is **not recommended** because electrical surges can damage your computer.

Setup complete

Your basic computer hardware is now set up. Before you start it up, spend some time arranging your workspace. A workspace that is arranged well can **improve your productivity** and **promote health**.

For more information on arranging your workspace, you can view the Computer Safety and Maintenance lesson in this tutorial.
Challenge! If you have a desktop computer that is already set up at home, take a look at it. ◦ Look at the **monitor cable**, and see where it connects to the computer case and monitor.

◦ Locate the **power cords** for the monitor and computer case.
◦ Locate the **audio ports**.
Does your computer have a **VGA monitor port**, or another kind?
Do you have a **USB** or **PS/2** mouse?
Do you have a **USB** or **PS/2** keyboard?
Is your computer plugged into a **surge protector**?

Chapter 11

Beginning to use your computer

Starting up a new computer

When you start up a new computer for the first time, it will walk you through **several steps** to set up and personalize it. These steps usually only take a few minutes, and some of them are optional. The exact steps will vary depending on what type of operating system you are using, but here are a few things you will usually be able to do.

Choose a language and location: Your operating system may have many different languages installed, so you'll need to choose the one you want to use. You may also have the option of choosing your location.

Watch a welcome video: Your computer may play a brief welcome video during the setup process, so it's a good idea to turn your speakers on to get the full experience.

Create a profile or account name: Your computer will need to have at least one **account name** that you'll use to sign in. You can also choose to create a password for extra security. If others will be using the computer, you can set up separate accounts for each person later on.

Choose a wireless network: If you have an existing wireless network, you can select it during the setup process. If you don't have one, you can skip this step (we'll talk about Internet and network settings in the Connecting to the Internet lesson).

Register your computer: You'll probably have the option of registering your computer, which will send your **name**, **address**, and **other information** to the computer company. If you don't want to register at this point, you can skip it.

If you're not sure what to do at a particular step, read the instructions on the screen carefully. There may be a **recommended** option you can choose, which will keep setup **as simple as possible**. In addition, some steps are **optional**, so if you're still not sure, you

can **skip** it.

If you're interested in creating multiple accounts, you can learn more in our Windows 8, Windows 7, and Windows XP tutorials.
Whenever you're creating a password, it's important to create a **strong** one that will be difficult for others to guess. For tips on creating a strong password, check out our Password Tips lesson. **Migrating your files and settings**

If you have another computer that has all of your **files** and **settings**, you'll probably want to copy them to the new computer. This is known as **migrating**. It's possible to manually move your files using an **external hard drive**, **DVD-ROM discs**, or an existing **home network**. This can be time consuming, and you may not be able to move all of your settings to the new computer.

However, your computer probably has a **built-in tool** to help you migrate your files and settings, and it may appear automatically during the setup process. This tool will let you choose what you want to move, and it will automatically move the selected items to the new computer. **PCs** and **Macs** have different tools for this purpose.

PCs use **Windows Easy Transfer**, which will either be on your installation disc or can be downloaded. To download it, go to the Windows Easy Transfer page.
Macs use **Migration Assistant**, which is built into every Mac. For more information, go to the Apple Support page.
Installing peripherals

If you have a **printer**, **scanner**, **webcam**, or other peripherals, you can connect them at this point. Many peripherals are **plug and play**, which means they will be recognized by your computer as soon as they are plugged in. Other peripherals may include **software** that needs to be installed before you can begin using them. Use the instructions included with the device to install it if necessary.

Generally, peripherals are **optional**, and you can add new ones at any time—you don't have to add all peripherals during the initial setup of your computer.

Setup complete!

You have now finished setting up your computer, and you can start using it. In the next lesson, we'll go over the basics of using your operating system so you can become comfortable with the way your computer works.

Challenge!

Is your computer **brand new**, or is it **used**? If it is brand new, what are some of the **setup steps** you had to take when you first turned it on?

If you have **old files** on another computer, how will you move them to the new computer? Does your computer have a **built-in tool** to help you do this?

How many people use your computer? Would it make sense to create **multiple accounts**?

Try creating a **strong password**. What makes a password strong?

Chapter 12

Getting to know the OS

Getting to know your computer's OS

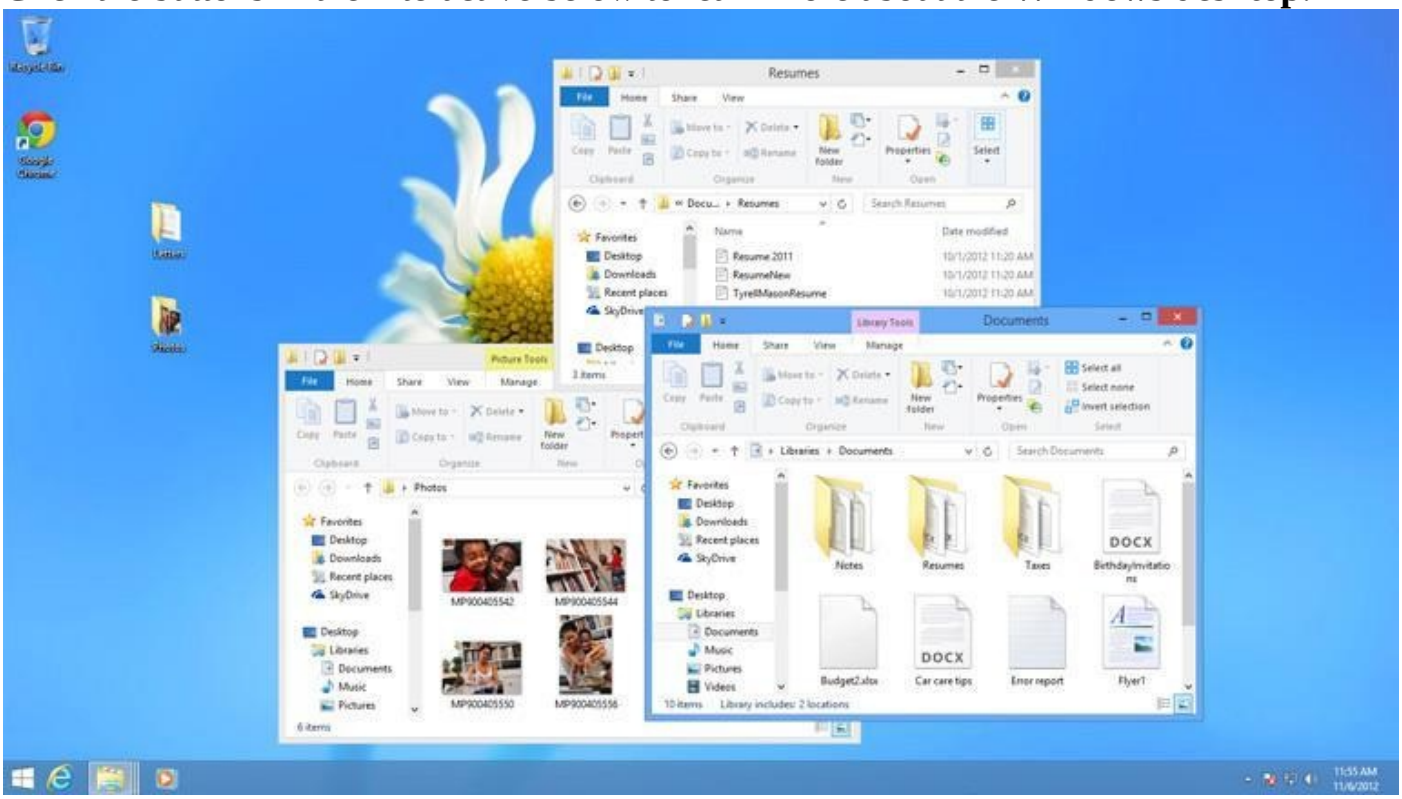
The screen you see when your computer has finished starting up is called the **desktop**. Depending on what kind of operating system you have, the desktop will look different, but it generally consists of **menus** at the bottom, top, and/or sides of the screen, with the rest of the screen containing a **desktop background**, or **wallpaper**. The desktop background area can also contain any **files**, **applications**, or **shortcuts** you want to have quick access to.

Watch the video to learn the basics of using Windows.

Getting to know the desktop

Both PCs and Macs have **desktops**, but their desktops look a bit different. The interactives below will introduce you to the Windows and Mac desktops.

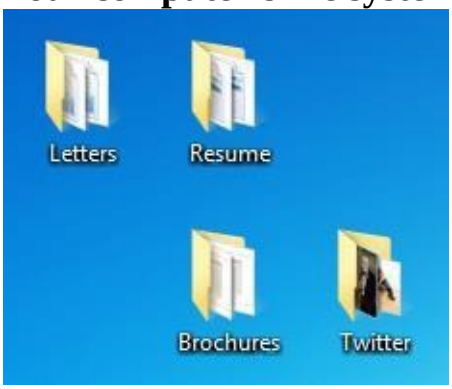
Click the buttons in the interactive below to learn more about the **Windows desktop**.



Click the buttons in the interactive below to learn more about the **OS X desktop**.

If you have difficulty seeing or hearing —or if you have trouble manipulating the mouse or keyboard—there are settings that can help make your computer easier to use. To learn more, check out our lesson on Accessibility Features.

Your computer's file system



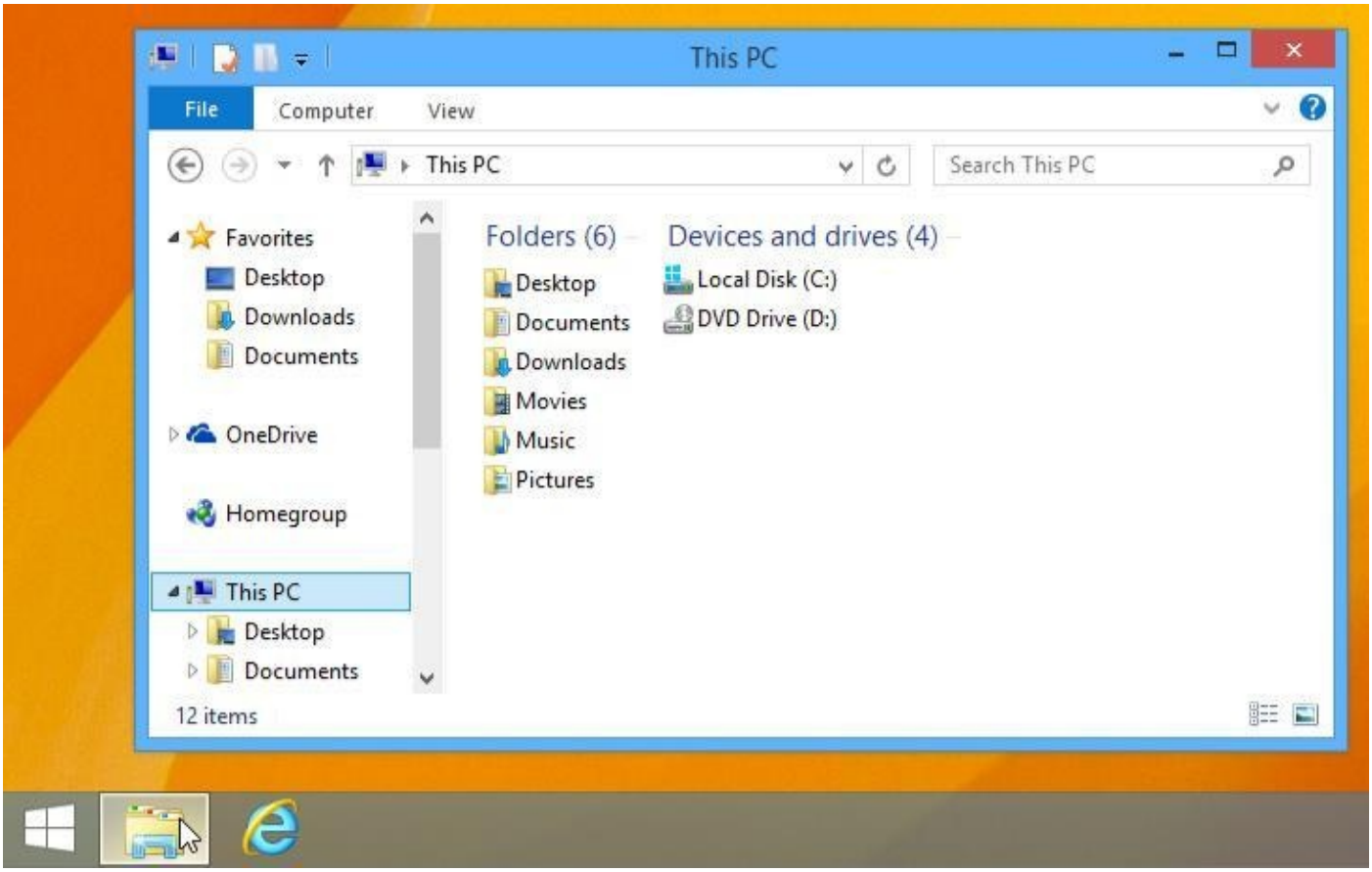
No matter which operating system you use, your computer uses **folders** to organize all of the different files and applications it contains. **Folder icons** on your computer are designed to look like file folders full of documents or pictures.

Each operating system has its own file system, which helps you find your folders and files. If your PC runs on **Windows 7 or earlier**, your file system will be called **Windows Explorer** (not to be confused with **Internet Explorer**, which is the PC's pre-installed web browser). If your PC runs on **Windows 8**, the file system will be called **File Explorer**. The file system for **Macs** is called **Finder**. Here, we'll talk about the basic functions that are common to all computer file systems.

To find out more about file systems on Macs, check out the lesson on Working with Files in our OS X Basics tutorial. To learn more about PC file systems, take a look at the Working with Files lesson in our Windows Basics tutorial.

Opening your computer's file system

Whether you're using a PC or a Mac, the file system icon will be in the bottom-left part of the screen. On a PC, the **Windows Explorer icon** looks like a folder, as in the image below.



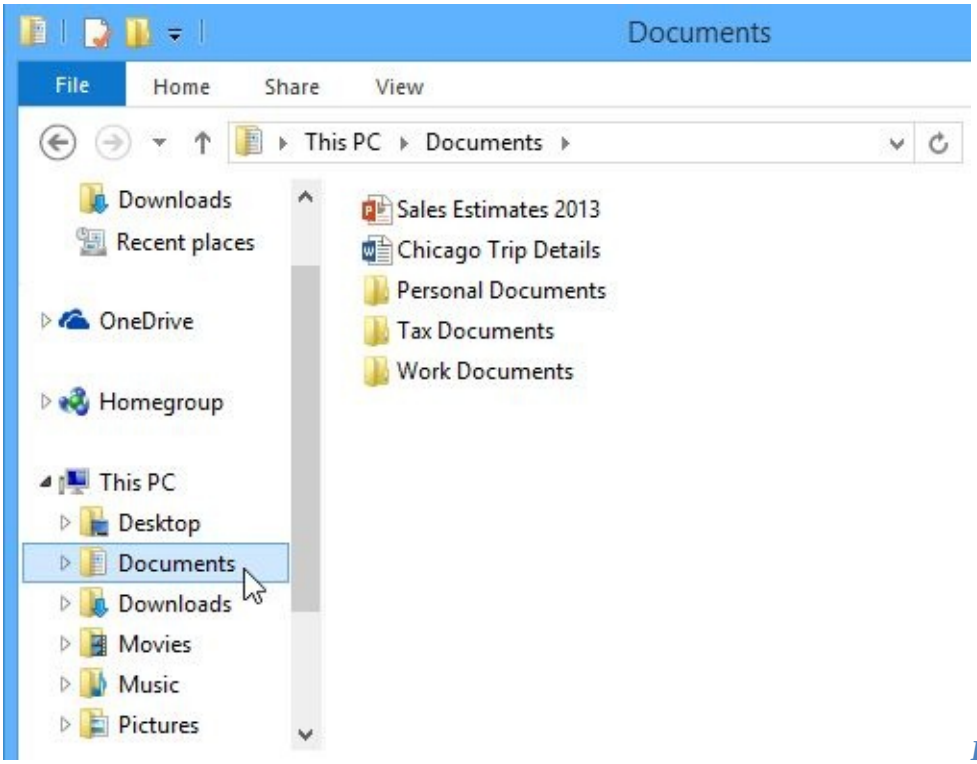
On a Mac, the Finder icon looks like a face and will be located in your Dock, as seen below.

In both operating systems, you can also open the file system by **clicking a folder** from

your **desktop**.

Basic navigation

Whether you're using Windows Explorer or Finder, basic navigation is the same. If you see the file you want, you can double-click it. Otherwise, you can use the **Navigation pane** on the left side of the window to select a different location.



Deleting files

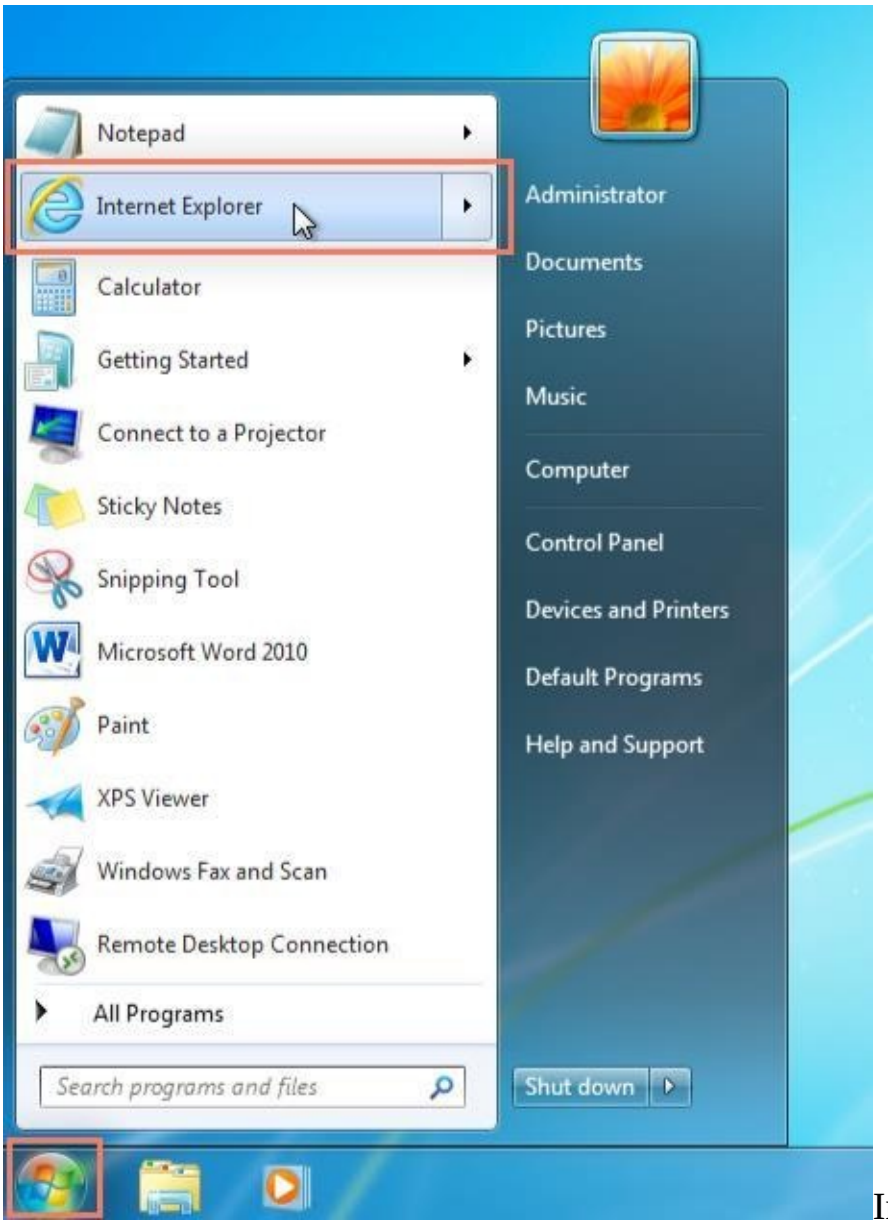
Windows and OS X use a **Trash can**—or **Recycle Bin**—to prevent you from accidentally deleting files. When you delete a file, it is moved to the Trash can. If you change your mind, you can move the file back to its original location. If you're sure you want to permanently delete the file, you will need to **empty the trash or recycle bin**.

Opening applications

When you double-click a file, it will automatically open in the **default application** for that file type. However, sometimes you may want to open an application directly.

To open an application on a PC:

Click the **Start** button, then select the desired application. If you don't see it, you can click **All Programs** to see a complete list. In our example, we've opened **Internet Explorer**. For convenience, commonly used applications may also have a **shortcut** on the **taskbar** or on the **desktop**.



In Windows 8, there is no Start menu, so you'll usually open applications from the **Start screen**. To learn more, check out our lesson on Getting Started with Windows 8.

To open an application on a Mac:

Click the application's icon on the **Dock**. If you don't see it, click the **Spotlight** icon in the topright corner of the screen and type the name of the application.

If you are using **OS X Lion** or a more recent version of OS X, you can also click the **Launchpad** icon on the Dock to select an application.

Adjusting your computer's settings

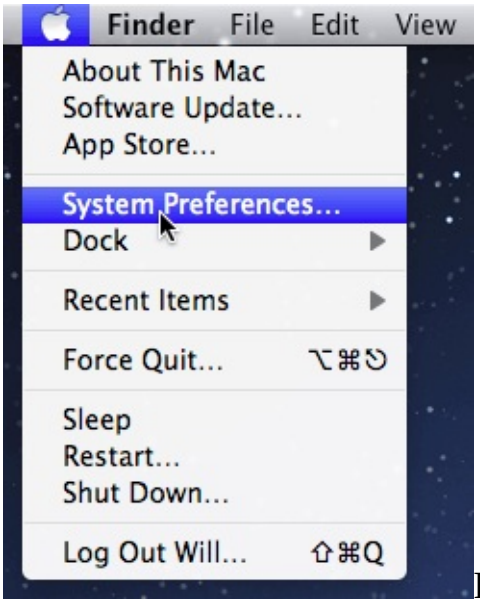
When you start using a new computer, you may want to begin by adjusting the computer's settings. Adjusting your settings can range from simple tasks such as changing your **desktop background** to more advanced tasks like adjusting your **security** or **keyboard settings**. On PCs, the **Control Panel** is used to adjust settings. On Macs, you'll use **System Preferences**.

To access your computer's settings:

In **Windows 7 or earlier**, click the **Start** button, then select **Control Panel**.

In **Windows 8**, you can open the Control Panel directly from the Start screen. Using your keyboard, type **Control Panel** and press the **Enter** key.

On a Mac, click the **Apple** icon, then select **System Preferences**.



For more information on changing settings on a **PC**, check out the Adjusting Your Settings lesson in our Windows Basics tutorial.

For more information on changing settings on a **Mac**, take a look at the Adjusting Your Settings lesson in our OS X Basics tutorial.

Shutting down your computer

When you're done using your computer, it's important to **shut it down properly**. Depending on your operating system, the exact procedure for shutting down will vary.

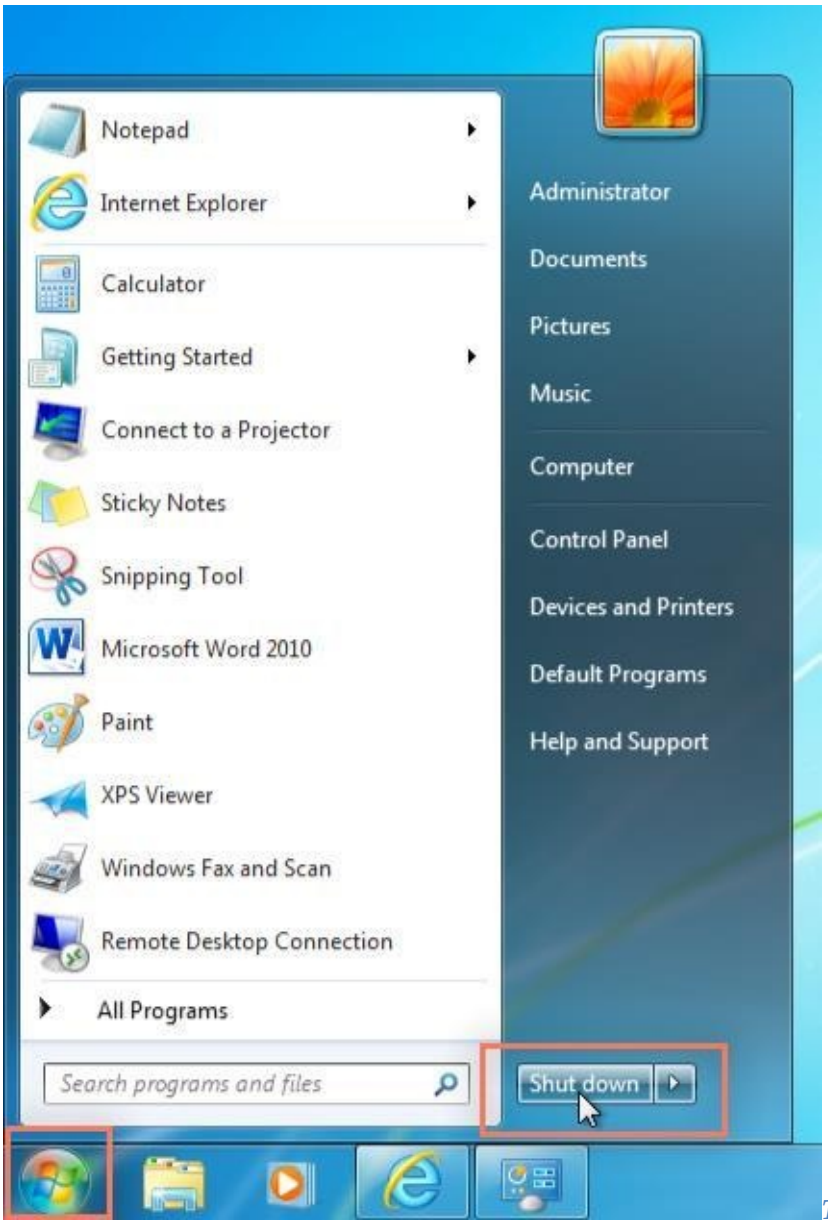
To shut down in Windows 8:

Click the **Start** button to access the **Start screen**, click the **Power** button

[redacted] near the top-right corner, and select **Shut down**.

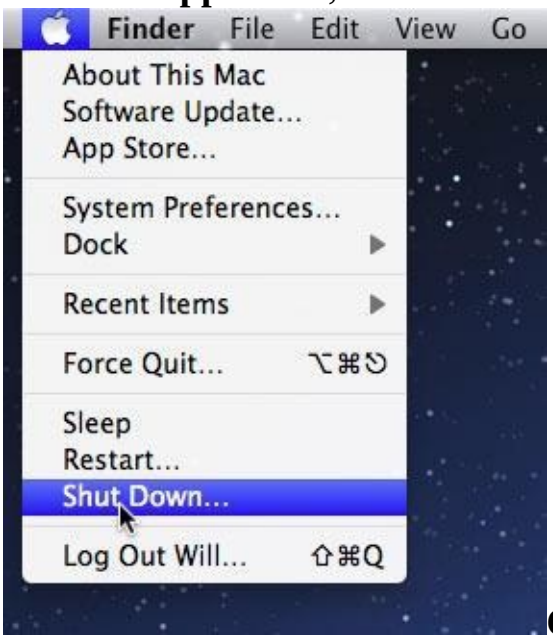
To shut down in Windows 7 or earlier:

Click the **Start** button, then select **Shut down** (in some versions, this may say **Turn Off Computer** or look like the power symbol [redacted]).



To shut down in Mac OS X:

Click the **Apple icon**, then select **Shut Down**.



Challenge!

Are you using a **PC** or a **Mac**? What kinds of menus and toolbars does it have? How do they change when you open an application?

What are **folders** used for?

Try **navigating different folders** on your computer.
What happens when you **double-click a file**?
Where do you go to **adjust settings** on a PC? On a Mac?

Chapter 13

Connecting to the internet

How do I connect to the Internet?

Once you've set up your computer, you'll probably want to get **Internet access** so you can send and receive email, browse the Web, watch movies, and more. Before you can access the Internet, there are three things you need: an **Internet service**, a **modem**, and a **web browser**.

Watch the video to learn about connecting to the Internet.

Choosing an Internet service

Which service is best for me?

It all depends on **where you live** and **how much speed** you need. **Internet service providers** (ISPs) usually offer different levels of speed based on your needs. If you're mainly using the Internet for **email** and **social networking**, a slower connection might be all you need. However, if you want to download a lot of **music** or watch **streaming movies**, you'll want a faster connection. You'll need to do some research to find out what the options are in your area. Here are some common types of Internet service.

Dial-up: Dial-up is generally the slowest type of Internet connection, and you should probably avoid it unless it is the only service available in your area. Like a phone call, a **dial-up modem** will connect you to the Internet by dialing a number, and it will disconnect when you are done surfing the Web. Unless you have multiple phone lines, you will not be able to use your land line and the Internet at the same time with a dial-up connection.

DSL: DSL service uses a **broadband connection**, which makes it much faster than dial-up. However, it is unavailable in many locations, so you'll need to contact your local ISP for information about your area. DSL connects to the Internet **via phone line** but does not require you to have a land line at home. Unlike dial-up, it will always be on once it's set up, and you'll be able to use the Internet and your phone line simultaneously.

Cable: Cable service connects to the Internet **via cable TV**, although you do not necessarily need to have cable TV in order to get it. It uses a broadband connection and can be faster than both dial-up and DSL service; however, it is only available in places where cable TV is available.

Satellite: A satellite connection uses broadband but does not require cable or phone lines; it connects to the Internet **through satellites orbiting the Earth**. As a result, it can be used almost anywhere in the world, but the connection may be affected by weather patterns. A satellite connection also relays data **on a delay**, so it is not the best option for people who use real-time applications, like gaming or video conferencing.

3G and 4G: 3G and 4G service is most commonly used with mobile phones and tablet computers, and it connects **wirelessly** through your ISP's network. If you have a device that's 3G or 4G enabled, you'll be able to use it to access the Internet away from home, even when there is no Wi-Fi connection. However, you may have to pay **per device** to use a 3G or 4G connection, and it may not be as fast as DSL or cable.

Choosing an Internet service provider

Once you have decided which **type of Internet access** you're interested in, you can

determine which **ISPs** are available in your area that offer the type of Internet access you want. Then you'll need to purchase Internet service from one of the available ISPs. Talk to friends, family members, and neighbors to see which ISPs they use. Below are some things to consider as you research ISPs:

Speed	
Price	
Ease of installation	Service record
Technical support	Contract terms

Although **dial-up** has traditionally been the **least expensive** option, many ISPs have raised dialup prices to be the **same as broadband**. This is intended to encourage people to switch to broadband. Generally, you should only use dial-up if it's the only option available.

Hardware needed

Modem

Once you have your computer, you really don't need much additional hardware to connect to the Internet. The primary piece of hardware you need is a **modem**.

The type of Internet access you choose will determine the type of modem you need. **Dial-up** access uses a **telephone modem, DSL** service uses a **DSL modem**, **cable** access uses a **cable modem**, and **satellite** service uses a **satellite adapter**. Your ISP may give you a modem—often for a fee—when you sign a contract, which helps ensure that you have the **right kind** of modem. However, if you would prefer to shop for a **better** or **less expensive** modem, you can choose to buy one separately.

Router

A **router** is a hardware device that allows you to connect **several computers** and **other devices** to a single Internet connection, which is known as a **home network**. Many routers are **wireless**, allowing you to easily create a **wireless network**.

You **don't necessarily need to buy a router** to connect to the Internet. It's possible to connect your computer directly to your modem using an Ethernet cable. Also, many modems now include a **built-in router**, so you have the option of creating a network without having to buy more hardware.

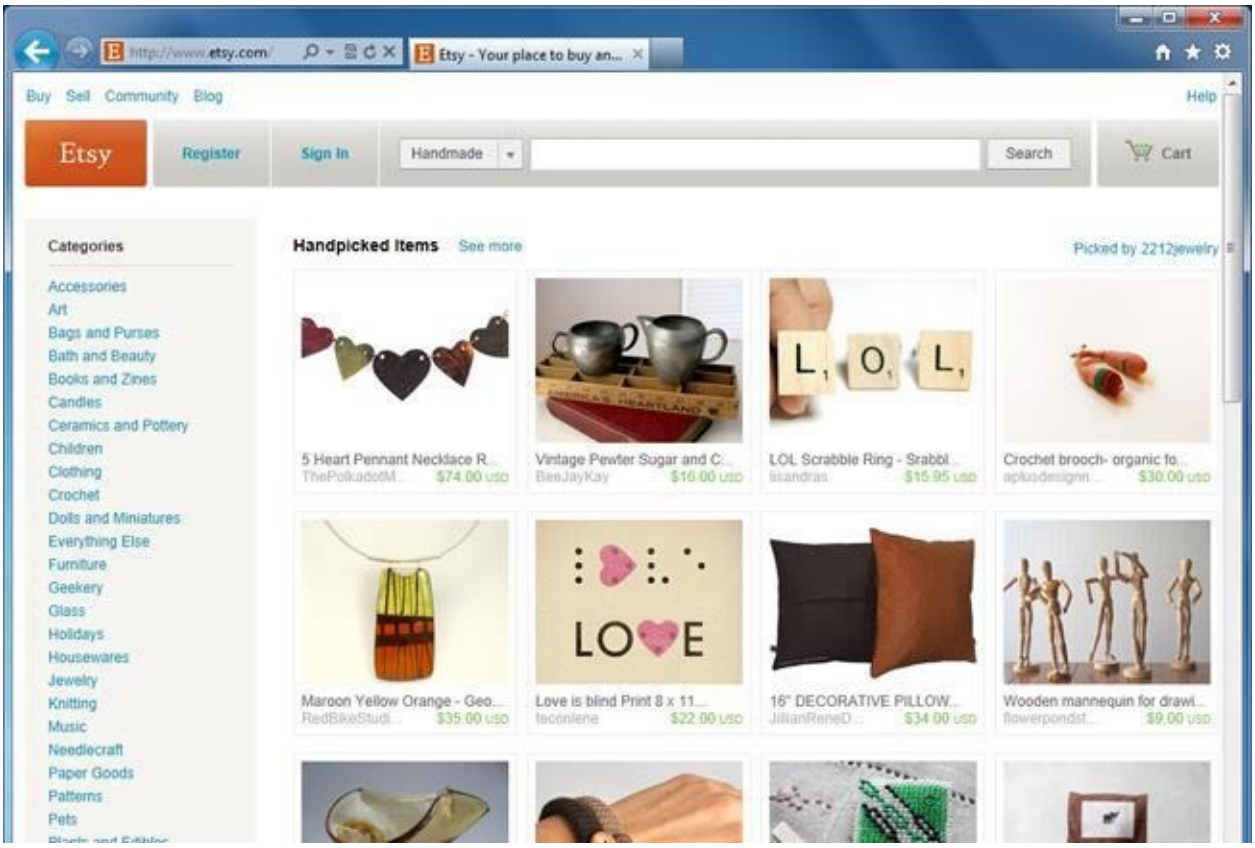
Most routers also act as a **hardware firewall**, which helps prevent others from gaining access to your computer through the Internet.

Network card

A **network card** is a piece of **hardware** that allows computers to communicate over a computer network. Most newer computers have a network card built into the motherboard, so it probably isn't something you'll need to purchase. The network card will have an **Ethernet** port, a **wireless** connection, or **both**.

If you have a **laptop** with a wireless connection, you can access the Internet at any place that offers a **Wi-Fi** connection. Many **restaurants**, **coffee shops**, **bookstores**, **hotels**, and other businesses offer free Wi-Fi. In addition, many cities provide free Wi-Fi in public areas such as **parks** and **downtown areas**.

Web browsers



A **web browser** is the tool you use to access the **Web**. The browser's main job is to **display webpages**. It also lets you create **bookmarks**—sometimes called **Favorites**—for sites you like so you can easily find them again later.

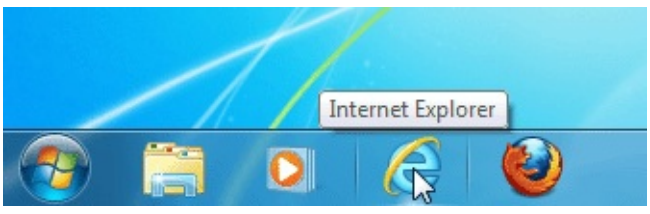
The **World Wide Web** is a **virtual network** of **websites** connected by **hyperlinks** (or **links**). Websites are stored on **servers** on the Internet, so the World Wide Web is a part of the Internet.

Your computer probably came with a browser **pre-installed**. **PCs** come with Internet Explorer, while **Macs** come with Safari. If you prefer to use a different browser, you can download Firefox, Google Chrome, or Opera. All of these browsers are **free**.

Setting up your Internet connection

Once you have chosen an **ISP** and purchased the appropriate **modem**, you can use the instructions provided by your ISP—or included with the modem—to set up your Internet connection. Depending on the type of service you have, your ISP may need to **send a technician to your house** to turn on the connection.

After you have everything set up, you can open your **web browser** and begin using the Internet. If you have any problems with your Internet connection, you can call your ISP's **technical support** number.



For more information on using the Internet, check out our Internet 101 tutorial. **Home networking**

If you have multiple computers at home and want to use all of them to access the Internet, you'll probably want to create a **home network**. In a home network, all of your devices connect to your **router**, which is connected to the **modem**. This means everyone in your family can use the Internet **at the same time**, and you don't have to purchase a separate Internet service for each computer.

How is a home network used?

Each computer on a network doesn't just connect to the Internet —it also connects to the **other computers and devices** on the network. This means you can easily **share files** with other computers. Some programs even let you **stream music and movies** from one computer to another. One example of this is the **Home Sharing** feature in **iTunes**. These types of features are easy to set up, but it's up to you whether you want to use them.

Home networks aren't just for families! Even if you live alone, you may have multiple devices that can connect to a network. Many **phones**, **printers**, **MP3 players**, **video game consoles**, and **digital video recorders (DVRs)** are equipped with wireless cards and often require very little setup to connect them to your home network.

Wireless security

A home network can be **wired** (using Ethernet cables) or **wireless** (using Wi-Fi). It may also be a **mixture** of the two, with some devices connecting with Ethernet and others connecting wirelessly. Wireless is generally more convenient; however, you'll need to think about **wireless security**. Below are some important security terms you'll need to know.

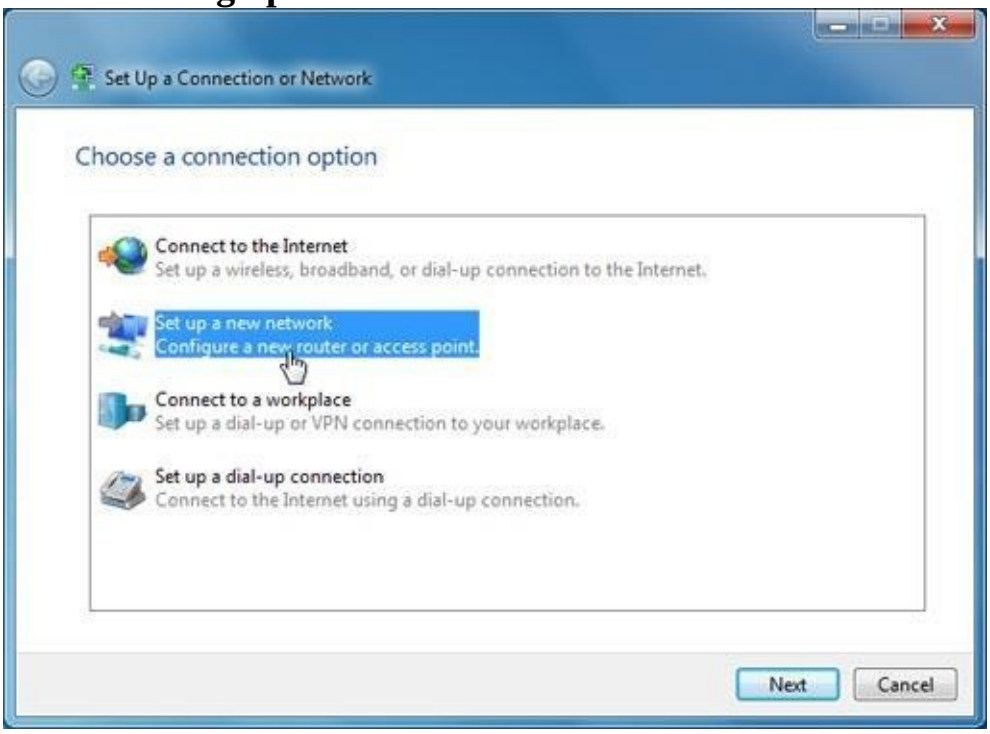
SSID: A **service set identifier**, commonly called the SSID, is the **name** of a wireless network. You should change the default SSID to something unique that you'll remember. You may not want to use your actual name, but you can use a hobby or other interest (like **rockclimbing1**).

Encryption password: An encryption password is a **series of characters** that is used to control access to the network.

For even greater security, some people use a **passphrase**, which is longer—and therefore more secure—than a password. You should choose a password or passphrase that's easy for you to remember but difficult for others to guess.

Encryption: Encryption prevents unauthorized users from reading data that is transmitted over your wireless network. The data is **coded** into an unreadable form, and it can only be **decoded** by a computer that has the correct **password** or **passphrase.** The most common types of encryption for wireless networks are **WPA (Wi-Fi protected access)** and **WPA2**.

Although it's possible to create a wireless network that doesn't have a password, it is **very risky**. You should always create a password or passphrase to protect it from unauthorized access. **Setting up a home network**



Before you set up your home network, you'll need to have a **working Internet connection**. The exact process of creating a network will vary depending on the type of computer you have, as well as what type of Internet service you have. You should use the instructions provided by your **ISP** (or the ones included with your **router**) when setting up your network. The following steps will give you an idea of what to expect.

1. If you have a separate **router**, connect it to the **modem**, and make sure it has power through the power adapter. If you have a combined router and modem, you won't have to do this.

2. Connect all nonwireless devices to your router using **Ethernet** cables. You may also need to connect your **computer** to the router until setup is complete, even if your computer has a wireless card.

3. From your computer, you will need to create the **SSID** and **password** or **passphrase** for your router. You now have a **wireless network** that you can begin connecting wireless devices to.

4. On each **wireless device**, you will need to go to your network settings and select the name (SSID) of the network you just created. You will then be prompted to type your password.

At this point, your home network setup is complete. If your network isn't working, the

instructions from your **ISP** should include some troubleshooting tips. You can also call your ISP's **technical support** number if you're still having trouble.

To learn how to safely use a wireless network, check out Wireless and Mobile Device Safety in our Internet Safety tutorial.

Challenge!

Research two or more **Internet service providers (ISPs)**, and compare their service packages. What are the different **connection speeds** offered by each provider?

Try using a few different **web browsers**. Do they work differently? Which one was easier to use?

Do you have any devices (computers, mobile phones, etc.) that can **connect wirelessly**? Would it make sense to create a **wireless network** in your home?

Section 5
Basic maintainance
Computer maintenance
Basic troubleshooting technique. Computer Basic For Everyone

Chapter 14

Computer safety and maintenance

How do I keep my computer healthy?

Computers are expensive, and with all major purchases you probably want to **protect your investment**. Luckily, it is not difficult to **keep your computer healthy** and in good working order. Maintaining a computer involves three things: keeping it **physically clean**, protecting it from **malware**, and **backing up** important files.

Watch the video to learn how to keep a computer healthy.

Keep your computer physically clean

When dealing with computers, dust isn't just unattractive —it can potentially destroy parts of your computer. By cleaning your computer regularly, you can help to **keep it working properly** and **avoid expensive repairs**.

Cleaning the keyboard

A dirty keyboard doesn't look nice and can cause your **keyboard** to **not work** properly. Dust, food, liquid, and other particles can get stuck underneath the keys, which can prevent them from working properly. Check your owner's manual to see if the manufacturer has provided you with instructions for your specific keyboard. If so, follow them. If not, the following steps are **basic cleaning tips** that can help keep your keyboard clean.

1. **Unplug** the keyboard from the USB or PS/2 port. If the keyboard is plugged into the PS/2 port, you will need to shut down the computer before unplugging it.
2. Turn the keyboard **upside down**, and gently shake it to remove dirt and dust.
3. Use a can of **compressed air** to clean between the keys.
4. Moisten a **cotton cloth** or **paper towel** with rubbing alcohol, and use it to clean the tops of the keys. Do not pour alcohol or any other liquid directly onto the keys.

5. **Reconnect** the keyboard to the computer once it is dry. If you are connecting it to a PS/2 port, you will need to connect it **before** turning on the computer.

Dealing with liquids

If you **spill liquid** on the keyboard, quickly shut down the computer and disconnect the keyboard and turn it upside down to allow the liquid to drain.

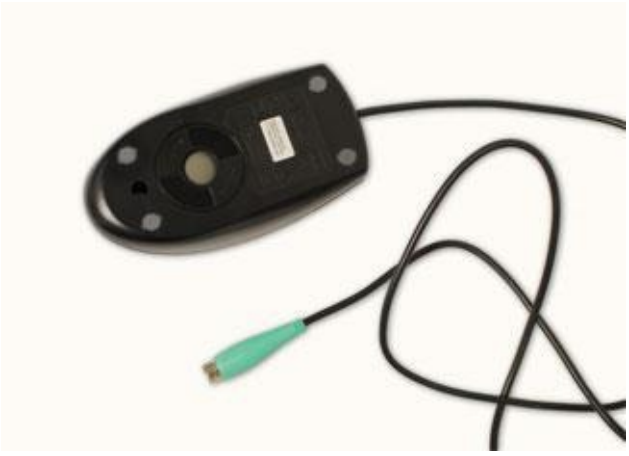
If the liquid is sticky, you will need to hold the keyboard on its side under running water to **rinse** the sticky liquid away. Then turn the keyboard upside down to drain for two days before reconnecting it. The keyboard may not be repairable at this point, but rinsing the sticky liquid off of it is the only chance for it to be usable again. The best way to avoid this situation is to keep drinks away from the computer area.

Cleaning the mouse

There are two main types of mice: **optical** and **mechanical**. Each is cleaned in basically the same way, although the mechanical mouse requires a bit more work.

Optical mice require **no internal cleaning** because there aren't any rotating parts; however, they can get **sticky** over time as dust collects near the light emitter. This can cause erratic cursor movement or prevent the mouse from working properly.

Mechanical mice are especially susceptible to **dust** and **particles** that can accumulate inside the mouse, which can make it difficult to track—or move—properly. If the mouse pointer does not move smoothly, the mouse may need to be cleaned.



Before you clean your mouse, check the owner's manual to see if the manufacturer has provided you with instructions for your specific mouse. If so, follow those instructions. If not, the following steps are **basic cleaning tips** that will help keep your mouse clean.

1. **Unplug** the mouse from the USB or PS/2 port. If the mouse is plugged into the PS/2 port, you will need to shut down the computer before unplugging it.
2. Moisten a **cotton cloth** with rubbing alcohol, and use it to clean the top and bottom of the mouse.

3. If you have a **mechanical mouse**, remove the **tracking ball** by turning the **ball-cover ring** counterclockwise. Then clean the tracking ball and the inside of the mouse with a **cotton cloth** moistened with rubbing alcohol.

4. Let **all of the parts dry** before reassembling and reconnecting the mouse. If you are connecting it to a PS/2 port, you will need to connect it **before** turning on the computer.

If you want to give the mouse a quick cleaning, place it on a **clean white sheet of paper** and move the mouse back and forth. Some of the dust and particles should rub off onto the paper.

Cleaning the monitor

Dirt, fingerprints, and dust can make your computer screen difficult to read; however, it's easy to **clean your screen** when needed. Although there are monitor-cleaning kits you can buy, they may damage your monitor if they are designed for a different type of monitor. For example, a monitor cleaner that is designed for **glass screens** may not work with some **nonglass LCD screens**. The safest method is simply to use a **soft clean cloth** moistened with **water**.

Do not use glass cleaner to clean a monitor. Many screens have anti-glare coatings that can be damaged by glass cleaner.

1. **Turn off** the computer.
2. **Unplug** the monitor from the power. If you are using a laptop, unplug the laptop.
3. Use a **soft clean cloth** moistened with **water** to wipe the screen clean.

Do not spray any liquids directly onto the screen. The liquid could leak into the monitor and damage the internal components.

Tips for cleaning other computer surfaces

From time to time, you should clean your computer case and the sides and back of the monitor to avoid buildup of dust and dirt. Here are a few tips you can use when cleaning these surfaces.

Dust is your computer's main enemy. Use an **antistatic** wipe to lightly dust your computer casing. **Don't use** furniture cleaners or strong solvents.

Use a can of **compressed air** with a narrow nozzle to blow out debris from the air intake slots.

Spray cleaning solution—like diluted ammonia cleaner or glass cleaner—on a **paper towel or antistatic** wipe. Clean the **monitor housing** and **case**—**not the monitor screen**—by wiping in a downward motion.

A safe cleaning solution for **computer surfaces**—not computer screens—is **ammonia diluted** with water or **glass cleaner** comprised mostly of ammonia and water (check the label). The milder the solution, the better.

Keep it cool

Don't restrict airflow around your computer. A computer can generate a lot of heat, so the casing has **fans** that keep it from overheating. Avoid stacking papers, books, and other items around your computer.

Many computer desks have an **enclosed compartment** for the computer case. If you have this type of desk, you may want to position the case so it is not against the back side of the desk. If the compartment has a door, you may want to leave it open to improve airflow.

Protecting your computer

Watch the video to learn how to protect your computer from viruses, as well as how to back up your files.

Safeguarding against malware

Malware is any type of software that is designed to **damage your computer** or gain **unauthorized access** to your personal information. It includes **viruses**, **worms**, **Trojan horses**, and **spyware**. Most malware is distributed over the **Internet** and is often bundled with other software.

The best way to guard against malware is to install antivirus software such as Bitdefender, Norton, or Kaspersky. Antivirus software helps to **prevent** malware from being installed, and it can also **remove** malware from your computer. New malware is being created all the time, so it's important to **update** your antivirus software frequently. Most antivirus programs can do this automatically, but you'll need to make sure this feature is **enabled**.

It's also important to **stay smart** when you're browsing the Web or using email. If a website or email attachment looks suspicious, trust your instincts. Keep in mind that your antivirus program **may not catch everything**, so it's best to avoid downloading anything that might contain malware.

To learn more about protecting your computer from malware, check out Protecting Your Computer from Internet Threats in our Internet Safety tutorial.

Backing up your computer

Imagine what would happen if your computer suddenly stopped working. Would you lose any important documents, photos, or other files? It may be possible to repair your computer, but your files may be **lost forever**. Luckily, you can prevent this by creating **backup** copies of all of your files (or just the important ones) on an **external hard drive** or an **online backup service**.

External hard drives

You can purchase an **external hard drive** and copy the contents of your computer to it. The **initial backup could take several hours**, so you will need to select a period of time when you do not need access to your computer. Running the backup overnight usually works best. Followup backups should be conducted on a regular basis but will not take as long because the drive will only need to copy your most recent files.

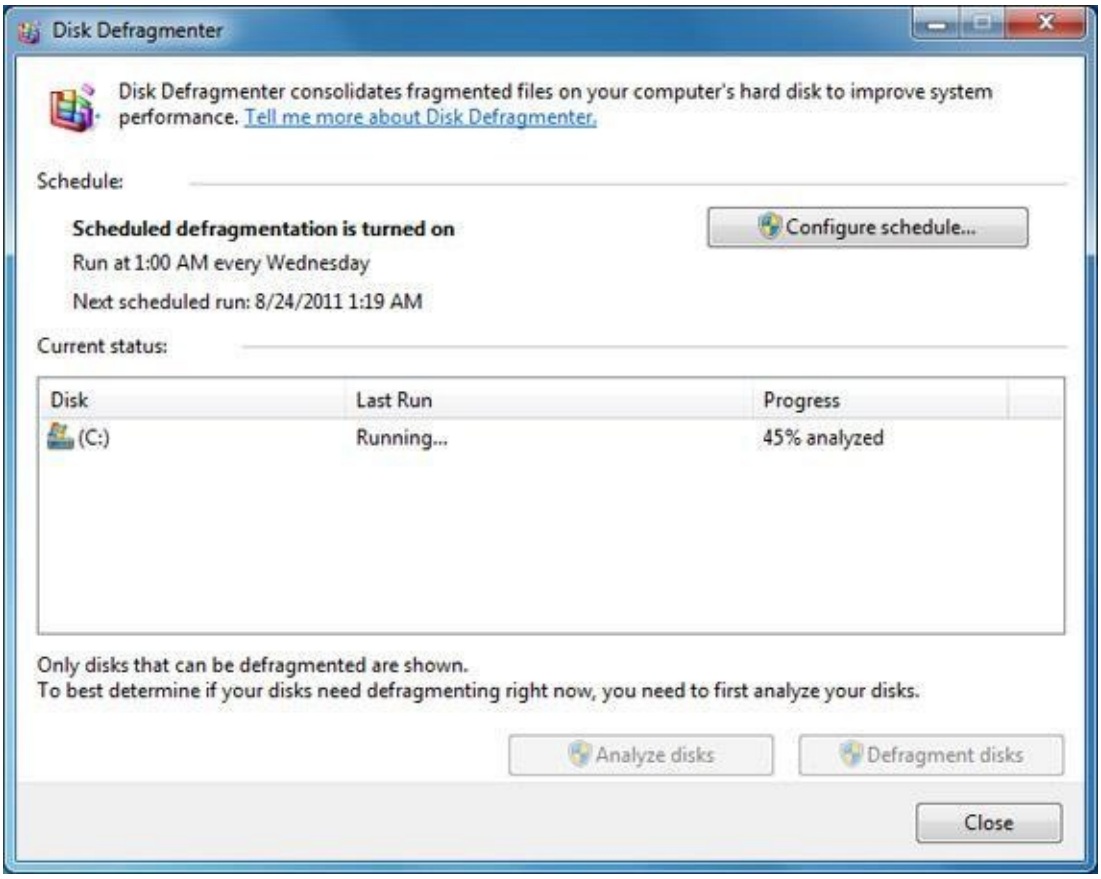
Western Digital , **Iomega**, and **Seagate** produce popular external hard drives. Conduct some research on which product best suits your storage needs, or ask a computer sales representative for recommendations.

One drawback, compared to online backup services, is that your external hard drive can be lost, damaged, or stolen just as your computer might be. Therefore, it is important to keep your drive in a **secure location** when not in use.

Online backup services

You can also back up your files to one of the **online backup services** like Mozy, Carbonite, or Box, and your files will always be accessible to you. The amount of storage space provided by these sites varies, and you may have to pay a monthly or yearly fee for adequate storage. Again, do your research because these services are constantly changing and offer varying features. One drawback to online backup services is that the **initial backup can be slow** and may even take days to upload if you have a lot of files. However, subsequent backups should not take as long.

Other maintenance techniques

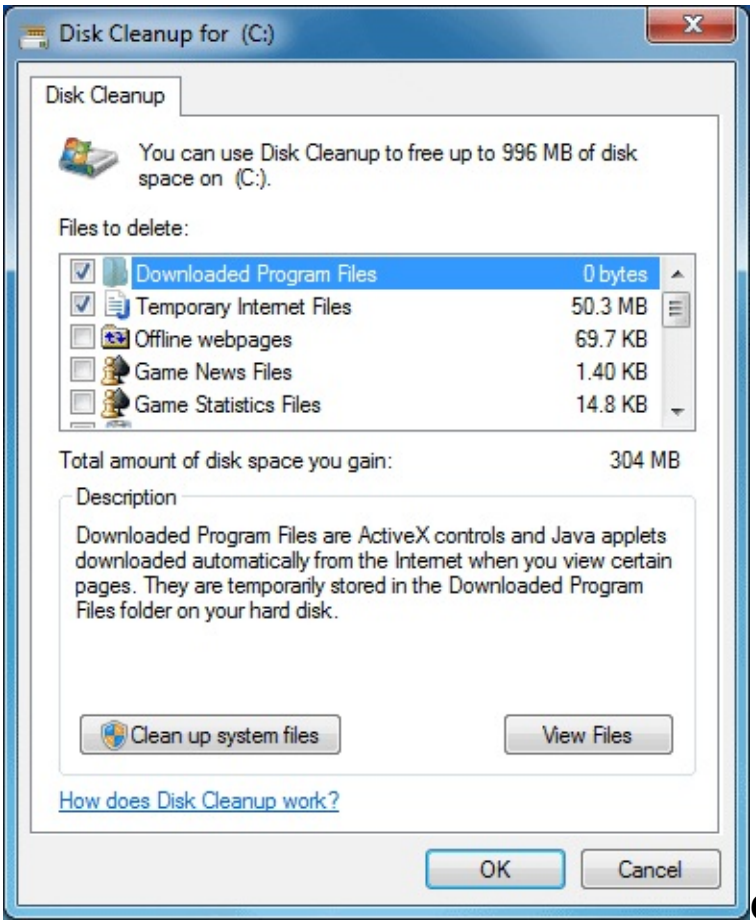


To keep your computer running smoothly, it's important to keep files and folders **uncluttered**. Cluttered or unorganized folders make it more difficult to find the files you need. Additionally, unwanted files can eventually fill up your **hard drive**, which will make your computer slower and more difficult to use. Here are a few things you can do to delete unwanted files and improve your computer's performance.

Delete files: If you have any unwanted files, you can delete them manually. To do this, drag them into the **Recycle Bin** or **Trash**, then empty it.

Run the Disk Defragmenter: Windows includes a **Disk Defragmenter** program in the Control Panel. It **scans** the files on your hard drive and **rearranges** them so it can read them faster. If your computer is running slowly, running Disk Defragmenter can help to speed it up.

Run a Disk Cleanup: Windows also includes a **Disk Cleanup** program in the Control Panel. It scans your computer for **temporary files** and other files that can be deleted. You can then delete the files to free up space on your hard drive.



Creating a safe workspace

Watch the video to learn more about arranging your workspace to avoid strain and injury.

Avoiding strain and injury

In addition to keeping your computer healthy, it's important to think about **your own health**. Using a computer involves a lot of repetitive motions such as **typing** and using the **mouse**. Over time, these motions can begin to take their toll on your body, especially your **wrists**, **neck**, and **back**. Staring at a monitor for long periods of time can also cause **eye strain**. To minimize this, you should take a few moments to make sure your workspace is arranged in a comfortable and healthy way.

Computer ergonomics is the science of equipment design and how specific equipment usage and placement can reduce a user's discomfort and increase productivity. Some equipment is designed with special attention to ergonomics, such as **ergonomic keyboards** and **ergonomic chairs**.

Here are a few tips to help you avoid injury in your workspace.

Adjust your chair: Make sure your chair is adjusted to allow you to sit in a natural, comfortable position. Many office chairs are specially designed to **support the lower back** and promote good posture.

Keep the keyboard at a comfortable height: Try to place the keyboard in a position that allows you to keep your wrists straight and relaxed to avoid wrist strain. Many desks have a keyboard tray that can keep the keyboard at a better height. You can also buy an **ergonomic keyboard** that is designed to minimize wrist strain.

Keep the mouse close to the keyboard: If possible, place the mouse right next to the keyboard.

If the mouse is **too far away**, it may be uncomfortable or awkward to reach for it. **Place the monitor at a comfortable distance:** The ideal position for a monitor is **20 to 40 inches** away from your eyes. It should also be **at eye level** or **slightly lower**.

Avoid clutter: The computer area can quickly become **cluttered** with paper, computer accessories, and other items. By keeping this area as uncluttered as possible, you can improve your productivity and prevent strain and injury.

Take frequent breaks: It's important to take breaks while you're working at your computer. To avoid eye strain, you should **look away from the monitor** every once in a while. You can also **stand up and walk around** to avoid sitting in the same position for long periods of time. Programs such as Eyes Relax and Workrave can automatically remind you to take breaks.

For more information on setting up a computer workspace, visit the Computer Workstations eTool from the Occupational Safety & Health Administration (OSHA).

Challenge! Take a look at your computer. Does it need to be **cleaned**?

Clean your monitor following the steps in the lesson. Be sure not to use glass cleaner or any harsh chemicals.

Based on the type of mouse you have, **clean your mouse** following the steps in the lesson. Do you have an **optical** or **mechanical** mouse?

What do you do if you **spill liquids** on your keyboard?

Does your computer have **antivirus** software installed? If not, research some of the different antivirus programs that are available.

What are two ways of **backing up** the data on your computer?

To minimize **eye strain**, how far should your monitor be from your eyes?

Section 2

Basic troubleshooting technique

Troubleshooting

Do you know what to do if your screen goes blank? What if you can't seem to close an application—or can't hear any sound from your speakers? Whenever you have a problem with your computer, **don't panic!** There are many **basic troubleshooting techniques** you can use to fix issues like this. In this lesson, we'll show you some simple things to try when troubleshooting, as well as how to solve common problems you may encounter.

General tips to keep in mind

There are many different things that could cause a problem with your computer. No matter what's causing the issue, troubleshooting will always be a process of **trial and error**—in some cases, you may need to use several different approaches before you can find a solution; other problems may be easy to fix. We recommend starting by using the following tips.

Write down your steps: Once you start troubleshooting, you may want to **write down** each step you take. This way, you'll be able to remember exactly what you've done and can avoid repeating the same mistakes. If you end up asking other people for help, it will be much easier if they know exactly what you've tried already.

Take notes about error messages: If your computer gives you an **error message**, be sure to write down as much information as possible. You may be able to use this information later to find out if other people are having the same error.

Always check the cables: If you're having trouble with a specific piece of computer **hardware**, such as your monitor or keyboard, an easy first step is to check all related cables to make sure they're properly connected.

Restart the computer: When all else fails, one of the best things to try is to **restart the computer**. This can solve a lot of basic issues you may experience with your computer.

Using the process of elimination

If you're having an issue with your computer, you may be able to find out what's wrong using **the process of elimination**. This means you'll make a list of things that could be causing the problem and then test them out one by one to eliminate them. Once you've identified the source of your computer issue, it will be easier to find a solution.

Scenario:

Leonardo is trying to print out invitations for his son's birthday party, but his printer won't print. He has some ideas about what could be causing this, so he goes through them one by one to see if he can **eliminate** any possible causes.

First, Leonardo checks his printer to see that it's turned on and plugged into his **surge protector**. He sees that it is, so that's not the issue. Next, he checks to make sure his printer's **ink cartridge** still has ink and that there is paper loaded in the **paper tray**. In both cases, things look good, so he knows the issue has nothing to do with ink or paper.

Now Leonardo wants to make sure his printer and computer are **communicating correctly**. If he had recently downloaded an **update to his operating system**, it might interfere with his printer. But he knows there haven't been any updates since last week and

his printer was working yesterday, so he'll have to look elsewhere. Leonardo checks the printer's **USB cord** and finds that it's not plugged in. He must have unplugged it when he plugged his phone into the computer earlier. Once Leonardo plugs in the printer's USB cord, his printer starts to print. It looks like his printer issue is solved.

This is just one example of an issue you might encounter while using a computer. On the following pages of this lesson, we'll go over other common computer problems and some ways to solve them.

Simple solutions to common problems

Most of the time, problems can be fixed using simple troubleshooting techniques, like **closing** and **reopening** the program. It's important to try these simple solutions before resorting to more extreme measures. If the problem still isn't fixed, you can try other troubleshooting techniques.

Problem: Power button will not start computer

Solution 1: If your computer **does not start**, begin by checking the power cord to confirm that it is plugged securely into the back of the computer case and the power outlet.

Solution 2: If it is plugged into an outlet, make sure it is a **working outlet**. To check your outlet, you can plug in another **electrical device**, such as a lamp or cellphone, and see if it receives electricity properly.

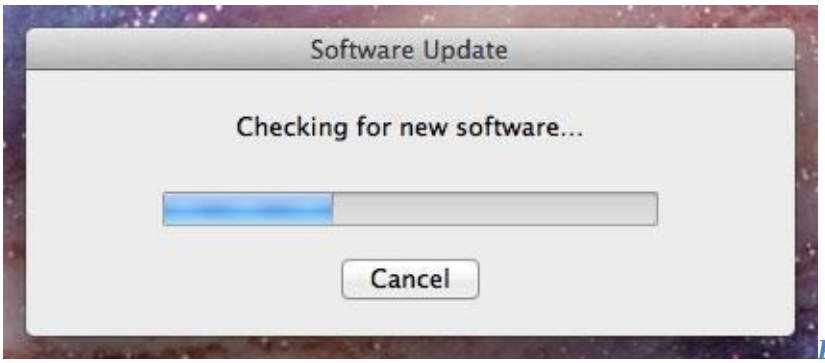
Solution 3: If the computer is plugged into a **surge protector**, verify that it is turned on. You may have to **reset** the surge protector by turning it off and then back on. You can also plug a lamp or other device into the surge protector to verify that it is on.

Solution 4: If you are using a **laptop**, the **battery** may not be charged. Plug the **AC adapter** into the wall, then try to turn on the laptop. If it still doesn't start up, you may need to wait a few minutes and try again.

Problem: An application is running slowly

Solution 1: Close and reopen the application.

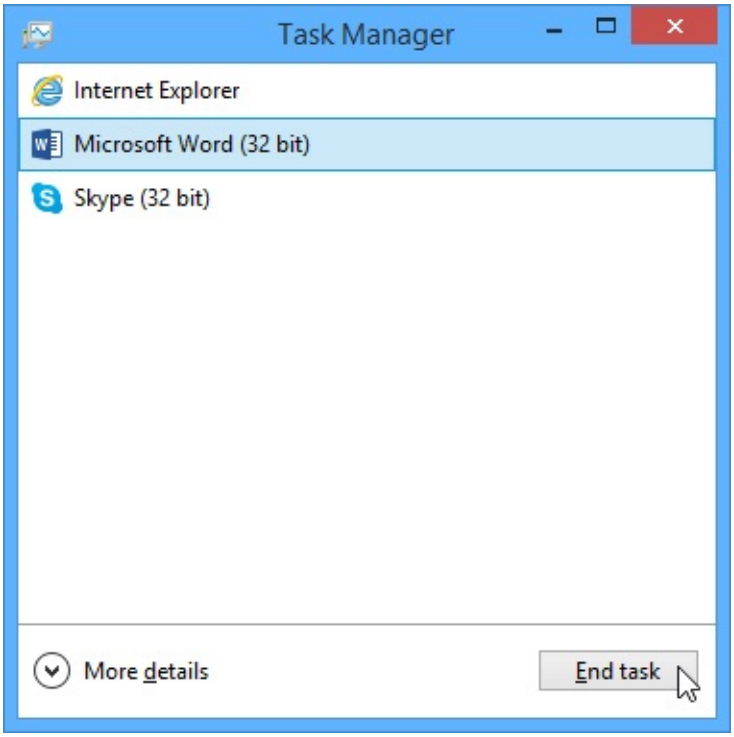
Solution 2: Update the application. To do this, click the **Help** menu and look for an option to check for **Updates**. If you don't find this option, another idea is to run an online search for application updates.



Problem: An application is frozen

Sometimes an application may become stuck, or **frozen**. When this happens, you won't be able to close the window or click any buttons within the application.

Solution 1: Force quit the application. On a PC, you can press (and hold) **Ctrl+Alt+Delete** (the Control, Alt, and Delete keys) on your keyboard to open the **Task Manager**. On a Mac, press and hold **Command+Option+Esc**. You can then select the unresponsive application and click **End task** (or **Force Quit** on a Mac) to close it.



Solution 2: Restart the computer. If you are unable to force quit an application, **restarting** your computer will close all open apps.

Problem: All programs on the computer run slowly

Solution 1: Run your **virus scanner**. You may have **malware** running in the background that is slowing things down.

Solution 2: Your computer may be running out of hard drive space. Try **deleting** any files or programs you don't need.

Solution 3: If you're using a **PC**, you can run **Disk Defragmenter** (called **Optimize Drives** in Windows 8). Doing so will make sure all pieces of each file or program are stored close together in your computer, so the computer will be able to access them more quickly. In most versions of Windows, the Disk Defragmenter can be found in the **Start** menu. In Windows 8, you can find it by typing **defragment** from the **Start screen**.

To learn more about **Disk Defragmenter**, check out our lesson on Computer Safety and Maintenance.

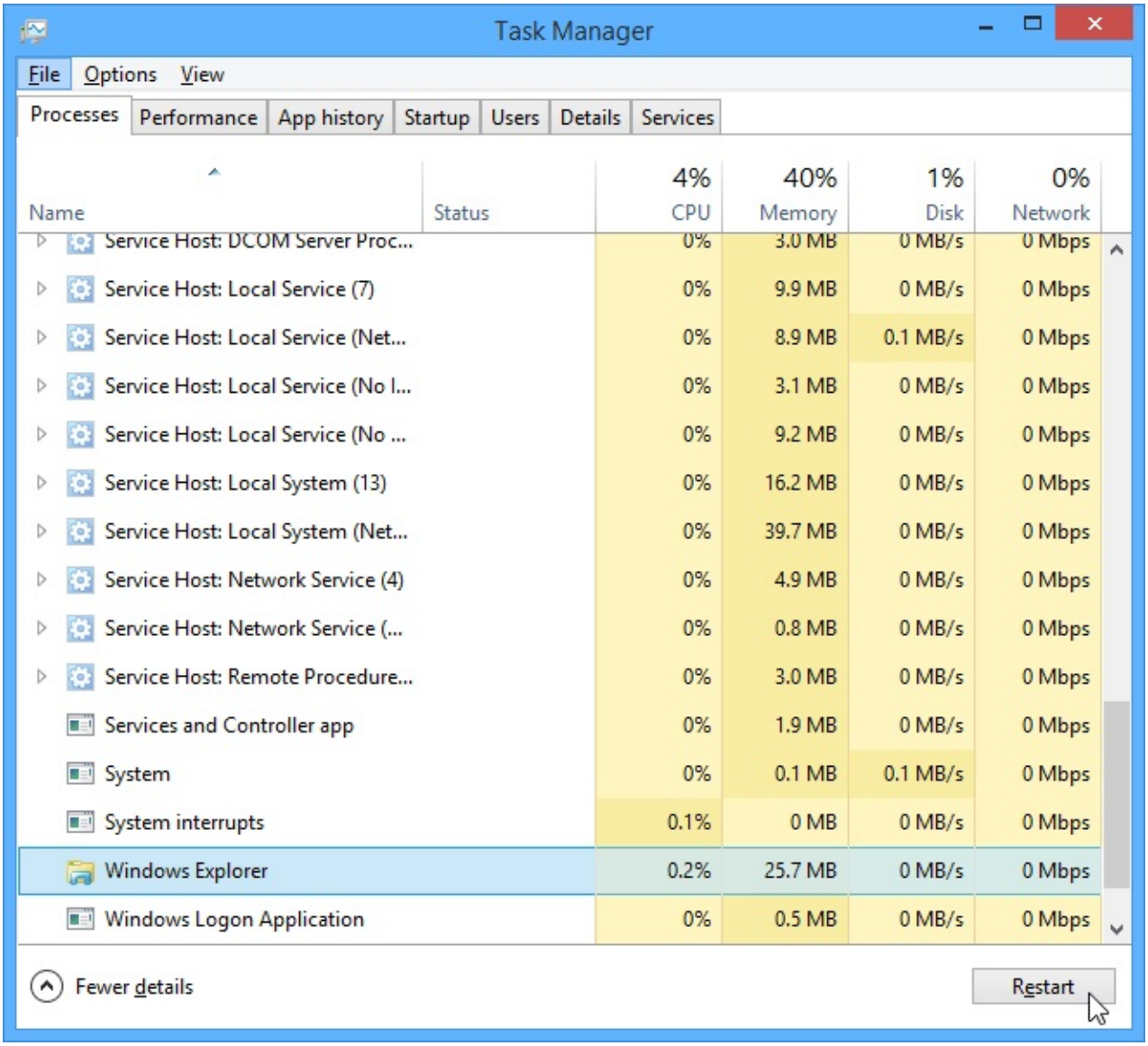
Problem: The computer is frozen

Sometimes your computer may become completely unresponsive, or frozen. When this happens, you won't be able to click anywhere on the screen, open or close applications, or access shutdown options.

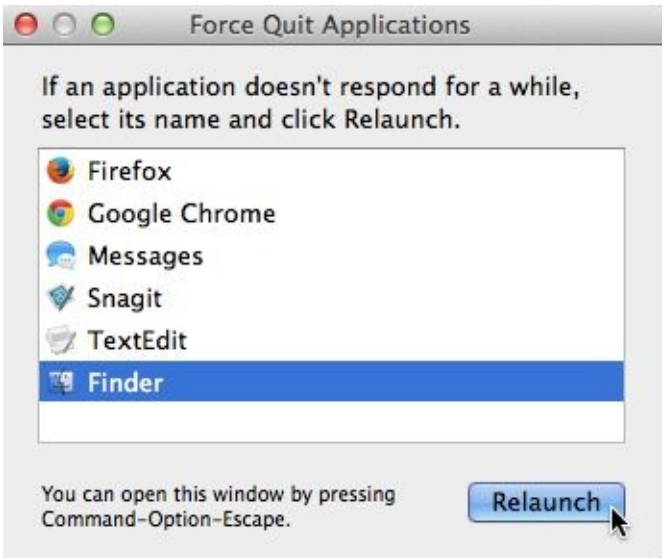
Solution 1 (Windows only): Restart Windows Explorer. To do this, press and hold **Ctrl+Alt+Delete** on your keyboard to open the **Task Manager**. Next, locate and select **Windows Explorer** from the **Processes** tab and click **Restart**. If

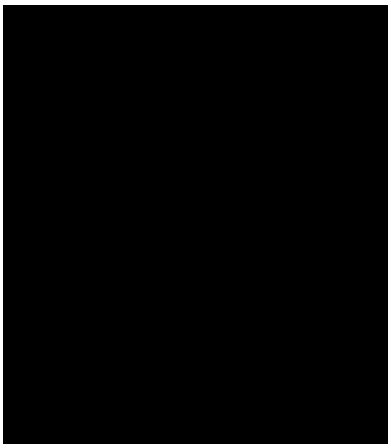
you're using Windows 8, you may need to click **More Details** at the bottom of the window to see the Processes tab.

Solution 3: Press and hold the Power button. The Power button is usually located on the front or



Solution 2 (Mac only): Restart Finder. To do this, press and hold **Command+Option+Esc** on your keyboard to open the **Force Quit Applications** dialog box. Next, locate and select **Finder**, then click **Relaunch**.





side of the computer, typically indicated by the **power symbol**

. Press and hold the Power button for **5-10 seconds** to force the computer to shut down. **Solution 4**: If the computer still won't shut down, you can **unplug the power cable** from the

electrical outlet. If you're using a laptop, you may be able to remove the battery to force the computer to turn off. **Note**: This solution should be your **last resort** after trying the other suggestions above.

Problem: The mouse or keyboard has stopped working

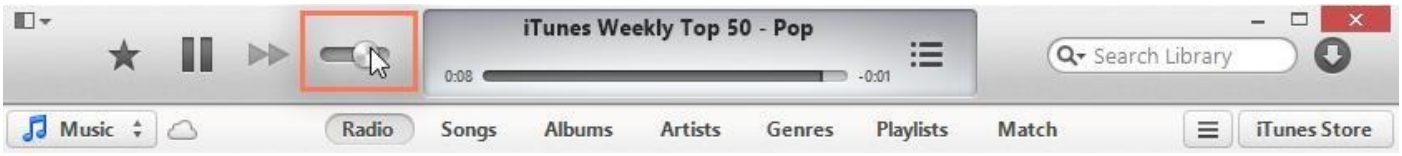
Solution 1: If you're using a **wired** mouse or keyboard, make sure it's correctly plugged into the computer.

Solution 2: If you're using a **wireless** mouse or keyboard, make sure it's turned on and that its batteries are charged.

Problem: The sound isn't working

Solution 1: Check the volume level. Click the audio button in the top-right or bottom-right corner of the screen to make sure the sound is turned on and that the volume is up.

Solution 2: Check the audio player controls. Many audio and video players will have their own separate audio controls. Make sure the sound is turned on and that the volume is turned up in the player.



Solution 3: Check the cables. Make sure external speakers are plugged in, turned on, and connected to the correct audio port or a USB port. If your computer has **color-coded** ports, the audio output port will usually be **green**.

Solution 4: Connect headphones to the computer, and see if you can hear sound from the headphones.

Problem: The screen is blank

Solution 1: The computer may be in **Sleep** mode. Click the mouse or press any key on the keyboard to wake it.

Solution 2: Make sure the monitor is **plugged in** and **turned on**.

Solution 3: Make sure the computer is **plugged in** and **turned on**.

Solution 4: If you're using a desktop, make sure the monitor cable is properly connected to the computer tower and the monitor.

lving more difficult problems

If you still haven't found a solution to your problem, you may need to ask someone else for help. Try **searching the Web** for the problem you're having because other users may have had similar problems. Also, if you have a friend or family member who knows a lot about computers, they may be able to help you.

Keep in mind that most computer problems have simple solutions, although it may take some time to find them. For difficult problems, a **more drastic solution** may be required, such as reformatting your hard drive, reinstalling programs, or reinstalling your operating system. If you're not a computer expert, it's possible that you could make the situation worse, so it's best to **consult a professional** if you believe a drastic solution is needed.

Challenge!

What do you do if a program on a PC is **completely unresponsive**? What about a program on a Mac?

What should you do if you've tried everything and the problem **still isn't fixed**?

Do you have a **family member** or **friend** who knows a lot about computers and would be able to help you with a computer problem?

Section 6
Extras

Bring your files with you Learning a new program Accessiblity features More resource
Quiz

extra

Bringing your files with you

Bringing your files with you

When you're working on a document or other computer file, you can always save it to your computer's **hard drive**. But sometimes you may want to **bring your file with you** and open it on a different computer. In this lesson, we'll talk about two ways to save your files so you can access them from almost anywhere.

Flash drive: Flash drives are **small removable hard drives** that plug into the **USB ports** on your computer. They are relatively inexpensive (usually less than $20) and can be purchased at any store with an electronics section.

Cloud storage: Cloud storage means you save your files on **servers** on the Internet using an account with a cloud service. With cloud storage, you can access your files from any computer with Internet access without having to keep track of a **physical device**.

Flash drives and the cloud can also be used to **back up** your files. To learn more, check out our lesson on Backing Up Your Files.

Using a flash drive

Flash drives make it easy to carry your important files and documents with you in a portable form. You should always back up the files on your flash drive elsewhere, however, just in case it gets lost or breaks.

To connect a flash drive:

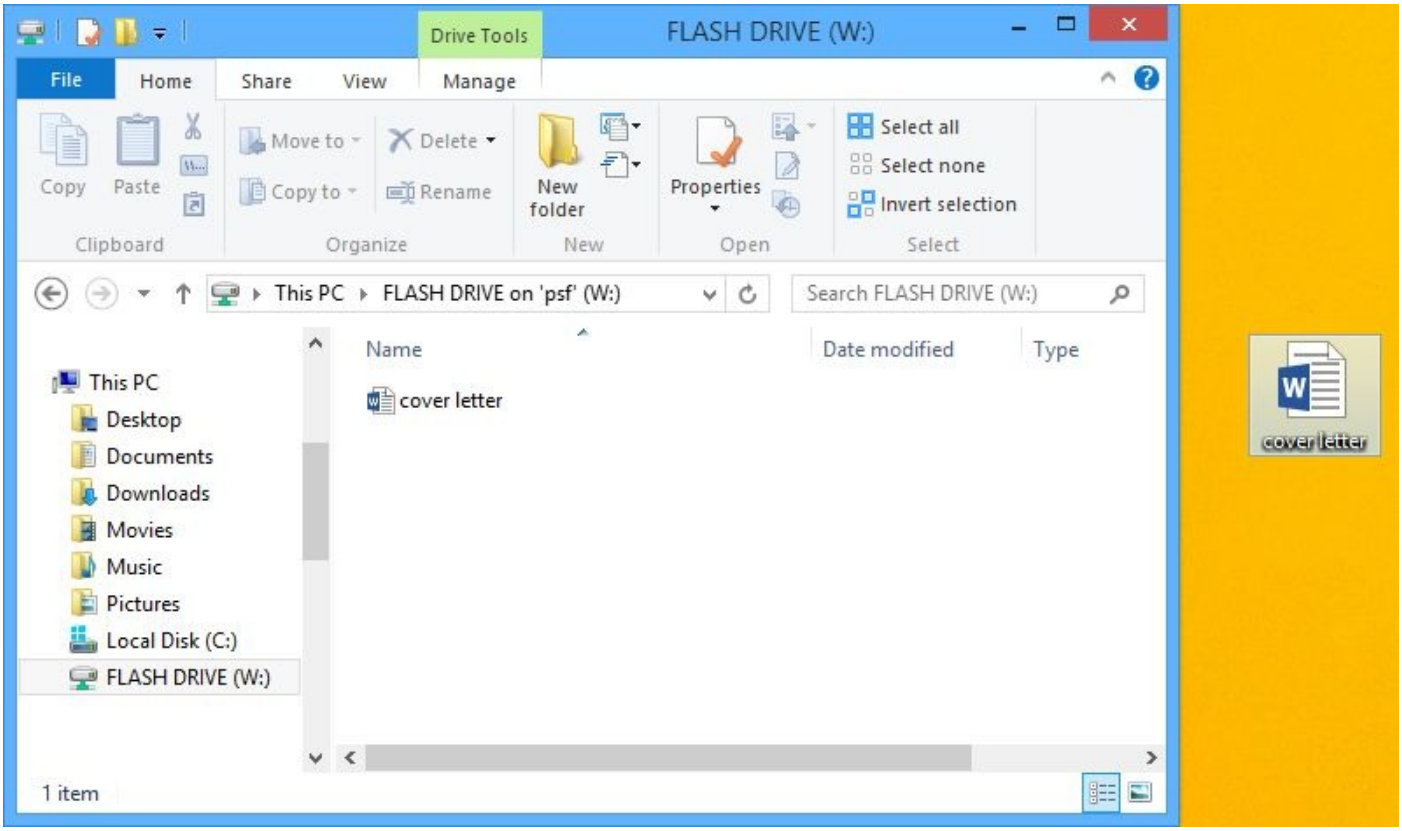
1. **Insert the flash drive** into a **USB port** on your computer. You should find a USB port on the front, back, or side of your computer (the location may vary depending on whether you have a desktop or laptop).

2. If you're using **Windows**, a dialog box may appear. If it does, select **Open folder to view files**. On a **Mac**, a **flash drive icon** will usually appear on the desktop.
3. If a dialog box does not appear, open **Windows Explorer**—or **Finder** if you're using a **Mac**—and select the flash drive on the left side of the window. Note that the **name** of the flash drive may vary.

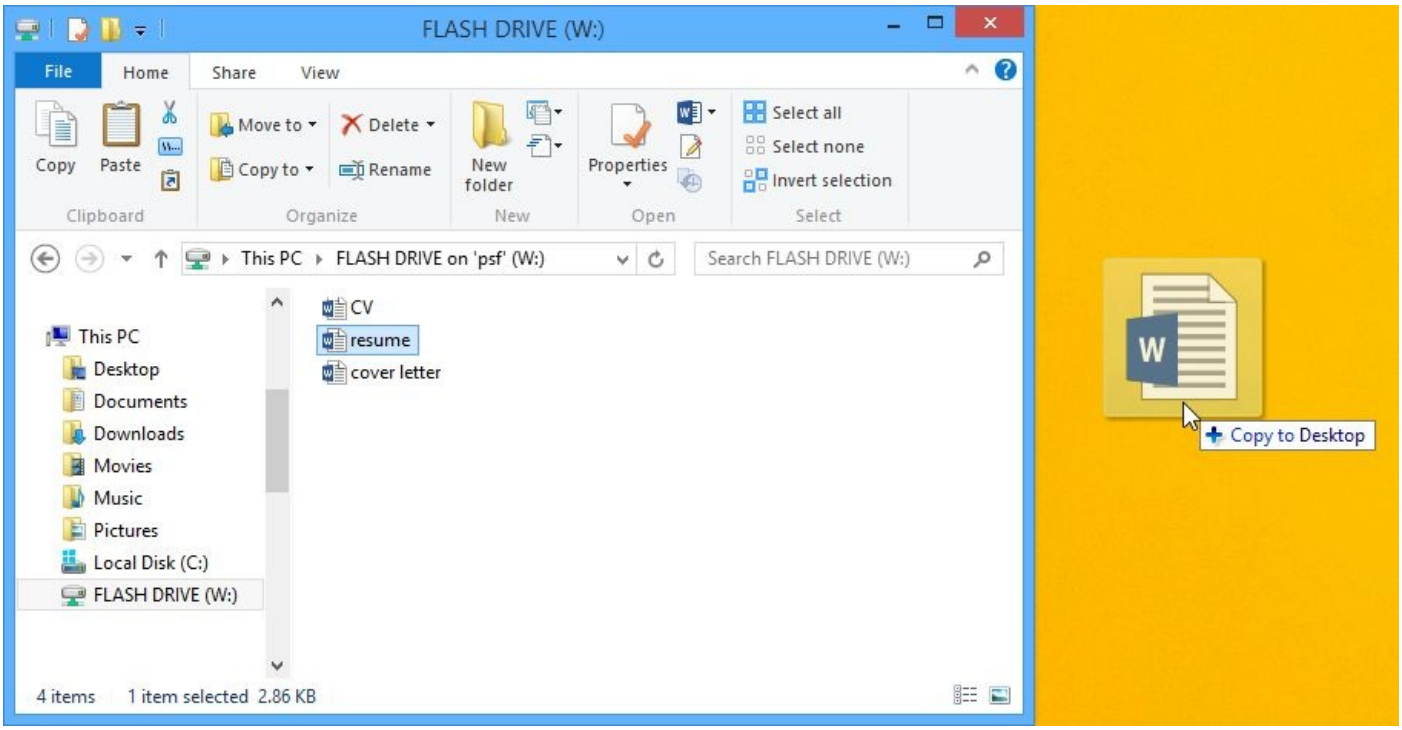
To work with a flash drive:

Once you've connected a flash drive, you can work with it just like any other folder on your computer, including moving and deleting files.

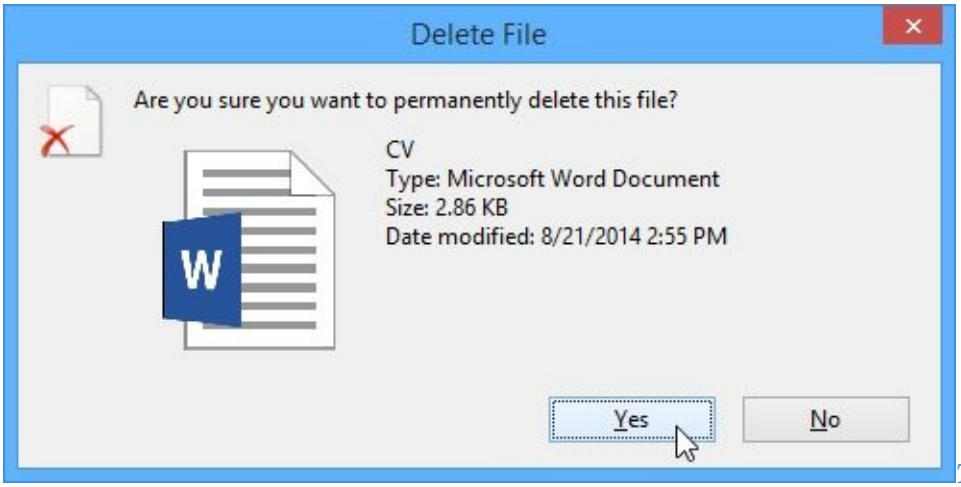
1. If you want to copy a file **from your computer to the flash drive**, click and drag the file from
2. The file will be **duplicated**, and this new version will be saved to the flash drive. The original version of the file will still be saved to your computer.



3. If you want to copy a file **from your flash drive to your computer**, click and drag the file from



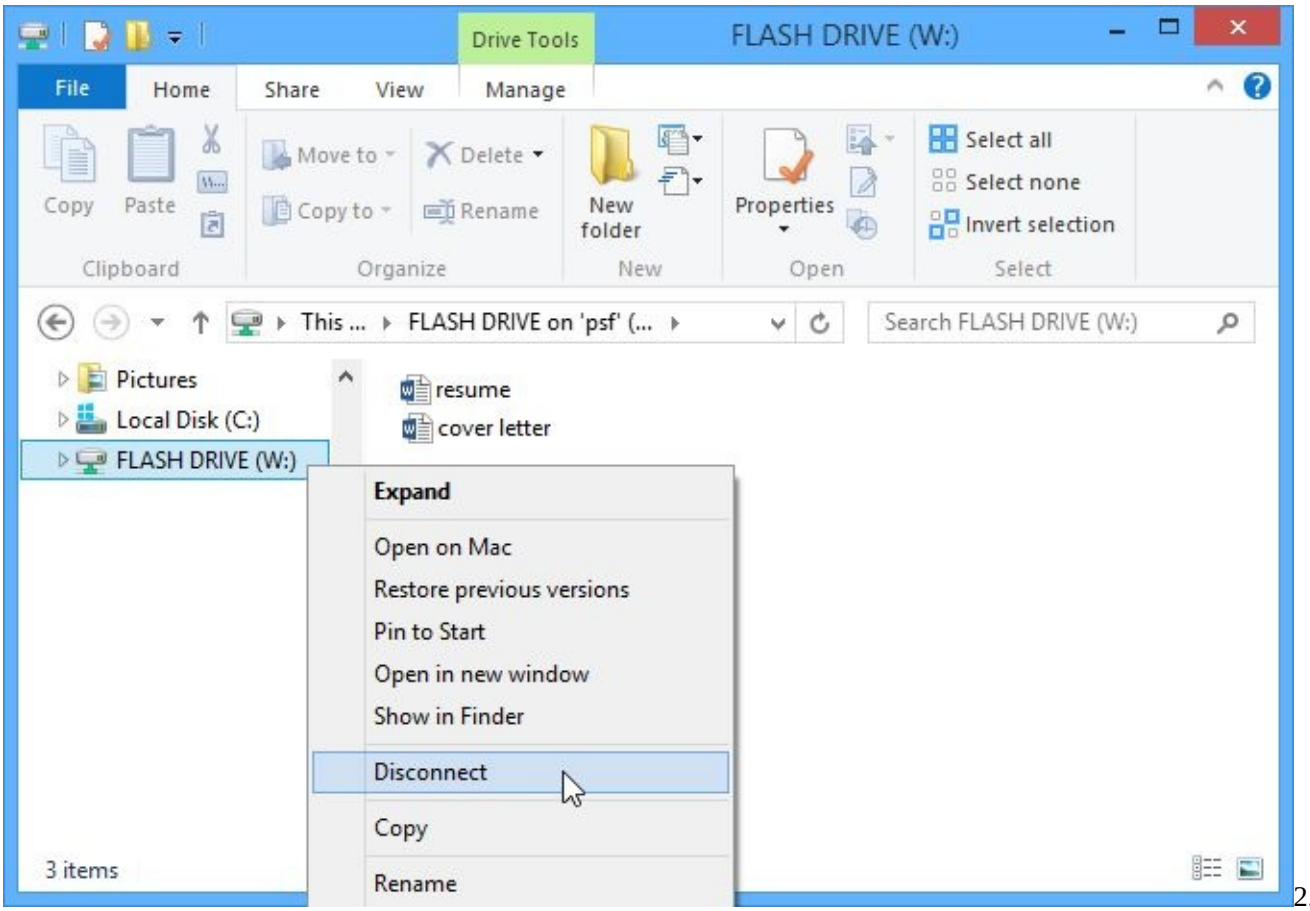
4. If you want to **remove a file from your flash drive**, click and drag the file to the **Recycle Bin** on a PC or the **Trash can** on a Mac. A dialog box will appear. Click **Yes** to confirm that you want to permanently delete the file.



To safely remove a flash drive:

When you're done using a flash drive, don't remove it from the USB port just yet. You'll need to make sure to disconnect it properly to avoid damaging files on the drive.

1. Right-click the flash drive and select **Disconnect** (or **Eject**).



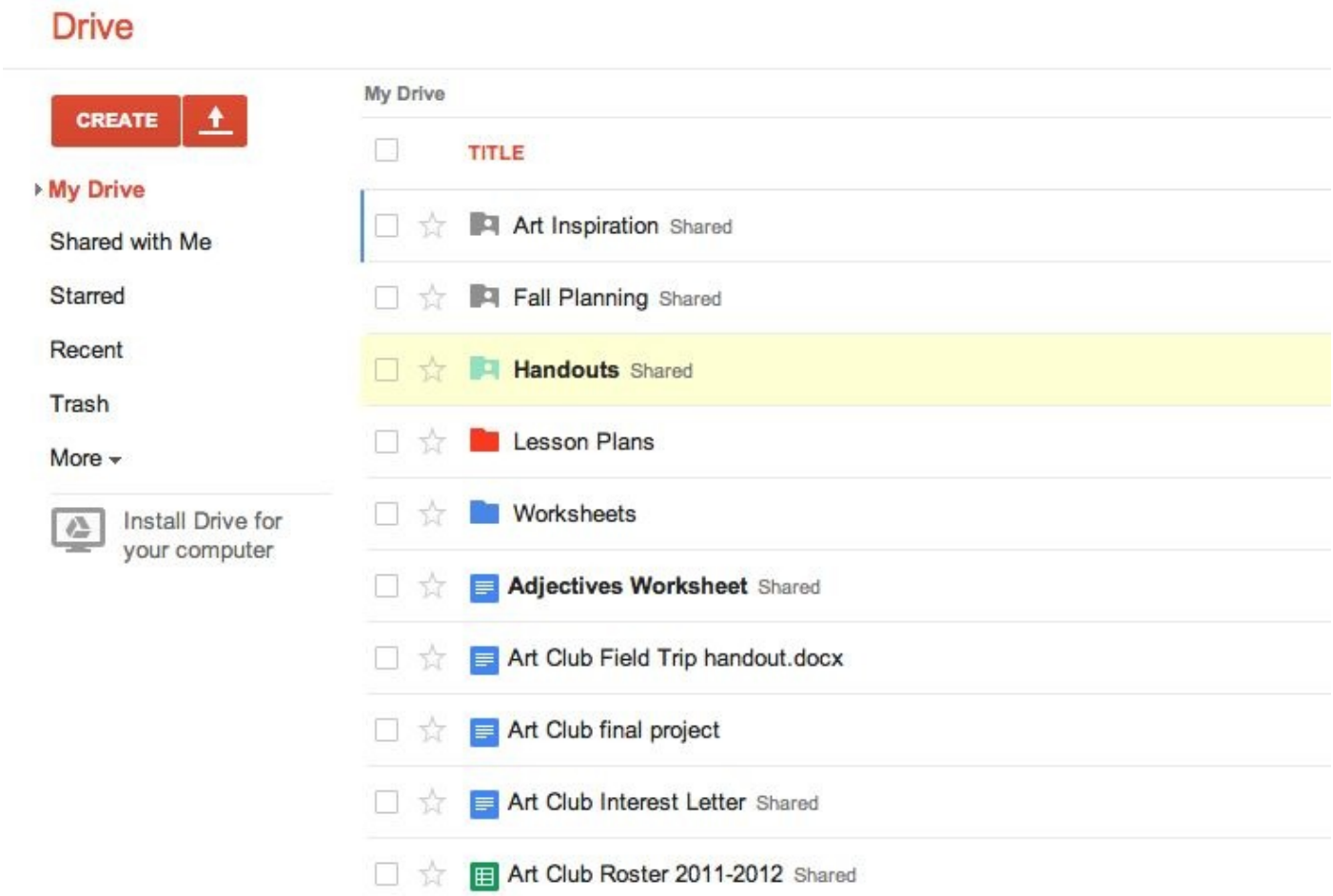
2. You can now safely remove the flash drive from the USB port.

If you're using a **Mac**, you can also click the **Eject** button next to the flash drive in **Finder** to eject it.

Saving files to the cloud

There are many services that allow you to create **a free account** and save documents, images, and other files **to the cloud**. Some of the most popular are Google Drive, OneDrive, and Dropbox. The **free storage space** that comes with these accounts (usually around **15GB**) should be plenty if you're using your account for regular personal, work, or school purposes. If you own a business and want to keep all of your documents in the cloud, you may want to pay your cloud service for more storage.

Unlike **physical media**, the cloud can't break or get lost, so you don't necessarily need to back up the files you keep on it. Files in the cloud are also easier to **share** so you can **collaborate** with friends and coworkers. However, when you save something online, there's always a risk that **unauthorized** users will try to gain access to your **personal information**. To protect your files, create a **strong password** and pay attention to the **privacy settings and policies** of the cloud service you're using.



To learn more about services that allow you to store your files in the cloud, check out our tutorials on Google Drive and OneDrive and Office Online.

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Learning a new program

You ask a friend who is good with computers to help you do something in a new program. The friend says she hasn't used the program before but will give it a try. Two minutes later, she's figured out what to do.

How did she do that? If you've experienced a situation like the one just described, it might seem like magic. But your friend probably just applied what she knew about computers and computer programs to the program you were trying to use. In this lesson, we'll show you how you can do the same thing.

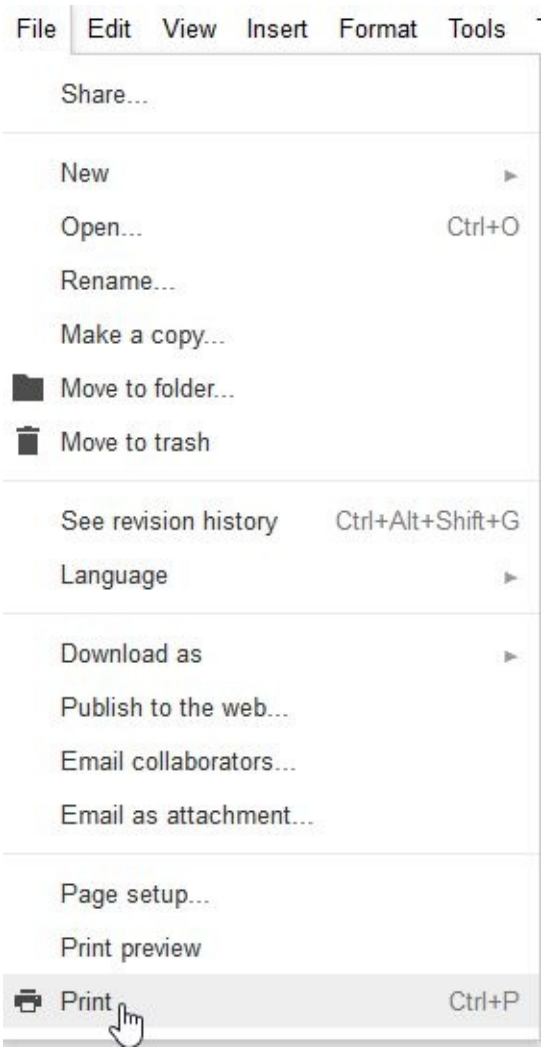
You know more than you think you do!

Starting to use a new computer **program** can seem overwhelming, but keep in mind that you already know more than you think you know. Even if the screen in front of you looks totally unfamiliar, everything you've learned so far about your computer and other programs will help you figure out what to do next. As you spend more time using the new program, it will start to feel more familiar.

Look for similarities with programs you've used

The first thing you'll want to do when opening a new program is look for **familiar features**. You may not realize it, but most computer programs have certain basic features in common—so once you've learned to use one program, you'll already know something about any other ones you try to use. For example, many **keyboard shortcuts** remain the same from program to program.

Most programs also have **File** and **Edit** menus, and they'll usually be in the same place—at the top of your screen, either as a **drop-down menu** or in a **ribbon**. The File and Edit menus tend to contain similar functions in any program. So if you know the **Print** function appears in the File menu in **Microsoft Word**, you'll have a good idea of where to look for it in **Google Drive**, as in the image below.



Even if you're switching from a **PC** to a **Mac** or vice versa, **keyboard shortcuts** will remain mostly the same. Just substitute the **Command** key on a Mac for the **Ctrl** key on a PC. For example, the shortcut for the **Cut** function is **Ctrl+X** on a PC—on a Mac, it's **Command+X**.

Check for hidden toolbars or panels

Let's say you've checked your new program for familiar functions, but there are a few you just can't find. Don't give up! If you believe a particular function should be there, you're probably right—you may just need to open it. Many programs have **toolbars**, **sidebars**, or **panels** you can **hide** or **make visible**, and they are often hidden by default when you start the program. If you can't find a function you need, try clicking the **View** or **Window** menu to check for hidden toolbars, as shown in the image of the Firefox web browser below.

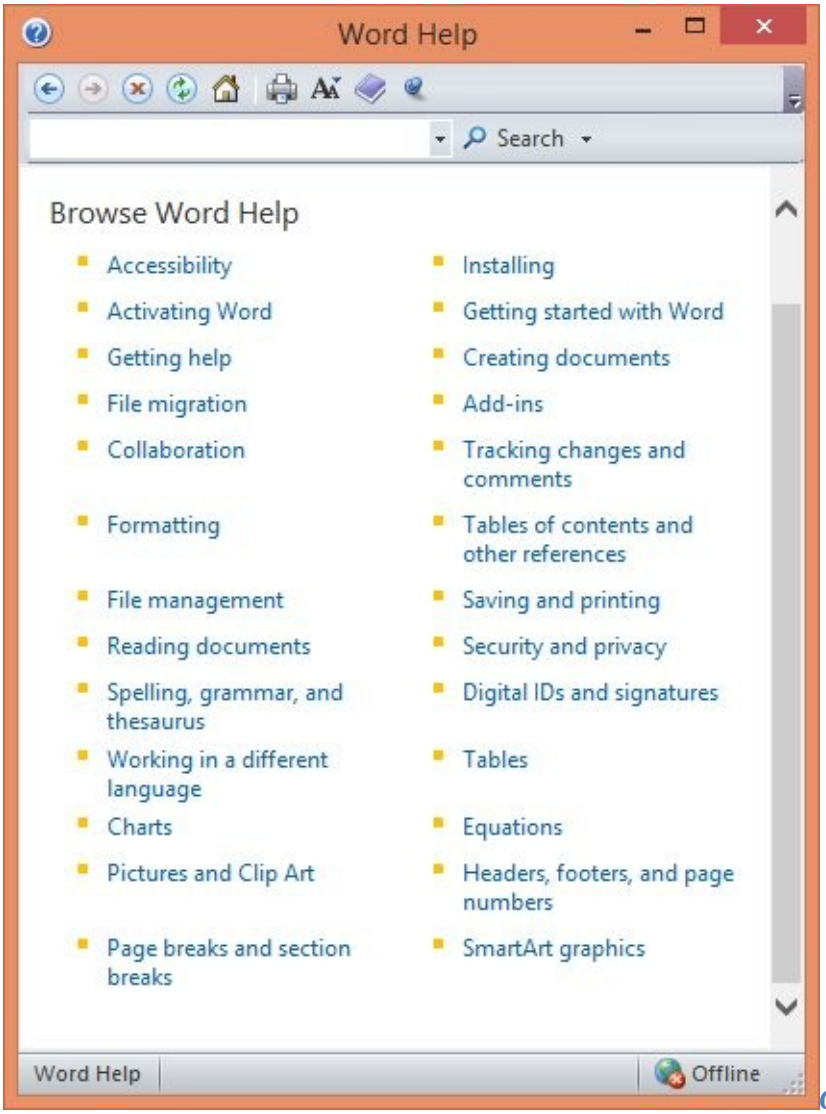
If you're having trouble

If the program you're trying to use has a lot of unfamiliar elements —or if there's a feature

you simply don’t know how to use—don’t despair. There are still some simple things you can do to find your way around a program.

Use the help feature

Software companies know that most users will have questions about how to use their programs, which is why they include **built-in help features**. You can usually access a program’s help feature by clicking a **Help** menu (sometimes represented by a **question mark icon**) at the top of your screen. There, you’ll find **instructions** on how to do things, **troubleshooting tips**, and answers to **frequently asked questions**. Some help features will even include links to **online help forums**, where users can post answers to each other’s questions. Remember, if something isn’t obvious to you, it probably isn’t obvious to other users either, so the help section should have some information on it.



Google it!

If you haven’t found the answer in the program’s help feature, try searching for a solution on Google. You will probably find tutorials or posts from other users explaining how to use the program. You may also want to search YouTube for video tutorials on the program you’re using. For tips on how to search effectively with Google, check out our lesson on Google Search Tips.

extra

Accessibility Features

What are accessibility features?

Accessibility features are special computer functions that help people with disabilities use technology more easily. For example, a **text-to-speech** feature may read text out loud for people with limited vision, while a **speech-recognition** feature allows users with limited mobility to control the computer with their voices. In this lesson, we'll introduce you to some **common accessibility features** and show you how to find and activate them on your computer or mobile device. We'll also discuss **assistive technology** that you can attach to your computer for additional accessibility.

Common accessibility features

Although some accessibility features require special software **downloads**, many are built into the operating system of your computer or mobile device. Here are just a few types of accessibility features you may already have on your device:

Features for blind or low-vision computer users: Features such as **text to speech** allow blind users to hear what's on the screen instead of reading it. Other features, such as **high-contrast themes** and **enlarged cursors**, make it easier for users with limited vision to read the text themselves.

Features for deaf or low-hearing computer users: Closed-captioning and **replacing sounds with visual cues** convey audio information to deaf users in visual form. **Mono audio** systems transmit right and left audio signals through both earbuds and headphones, so users with limited hearing in one ear will not miss part of what they are listening to.

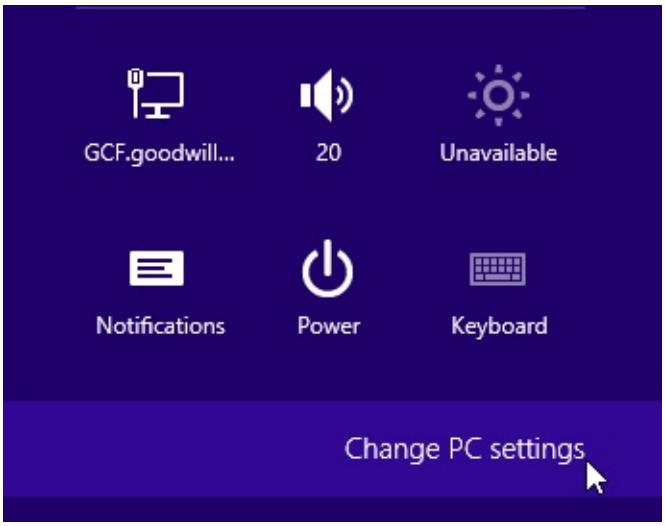
Features for limited-mobility computer users: Keyboard shortcuts are convenient for many people, but they are especially helpful to those with difficulty physically manipulating a mouse. For users who have difficulty pressing several keys at once, **sticky keys** allows them to press keys one at a time to activate a shortcut.

Finding accessibility features on your computer

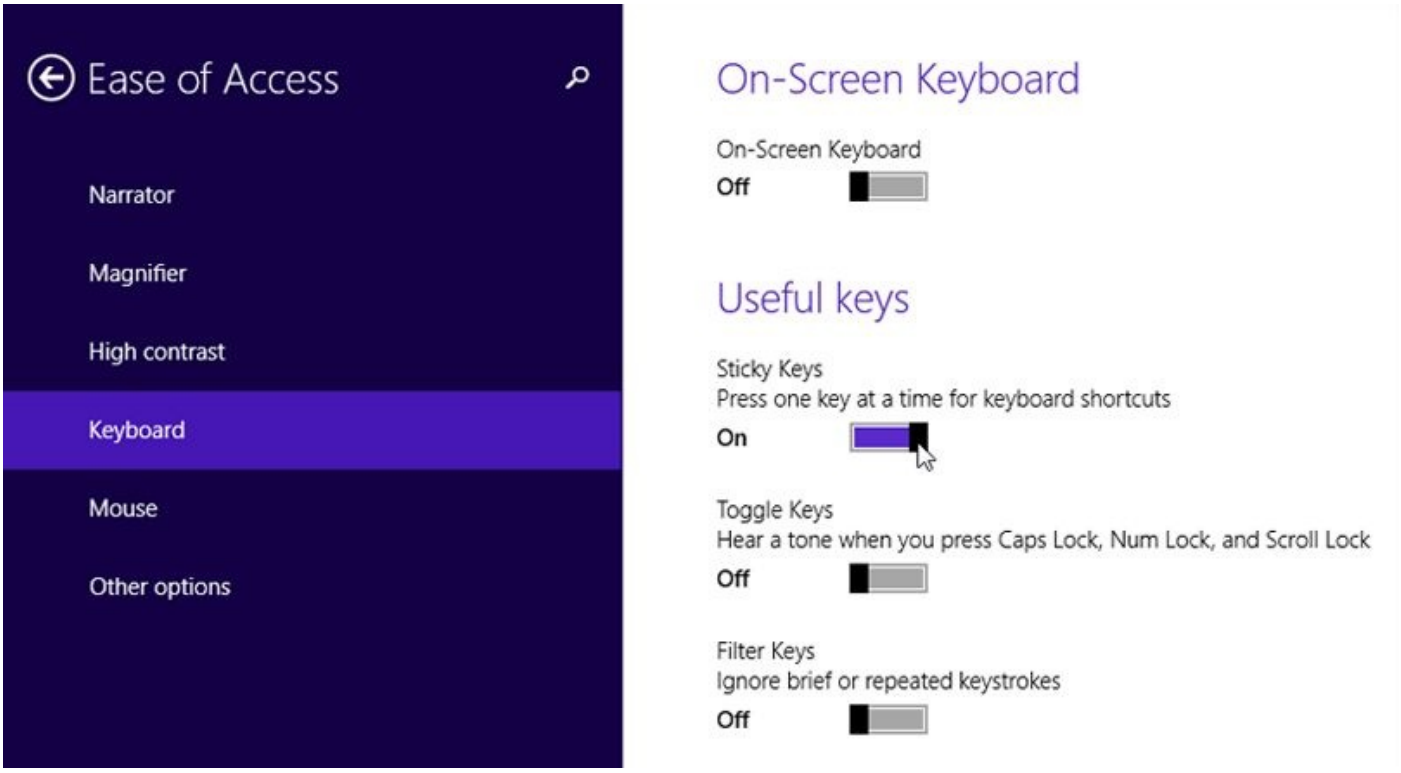
Not all computers come with the same accessibility features. To find out which ones are available on your computer, navigate to the **Accessibility** or **Ease of Access** menu. There, you can activate or adjust the features you need.

To find accessibility features in Windows 8:

1. Hover your mouse in the lower-right corner of the screen to bring up the **Charms** bar. If you are using a touch-screen, you can access the **Charms** bar by swiping inward from the right edge of the screen. From the **Charms** bar, click **Settings**.
2. The **Settings** bar will appear. In the lower-right hand corner, click **Change PC Settings.**

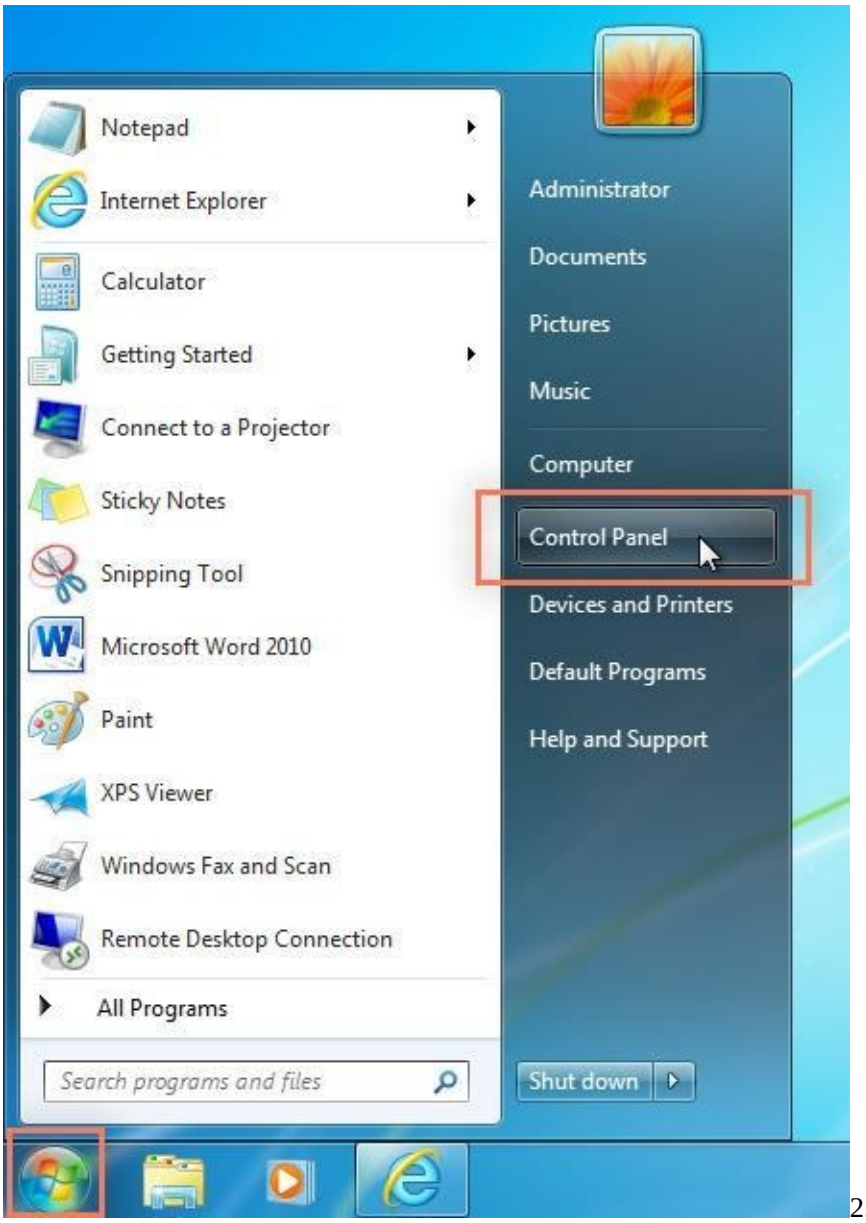


3. The **PC Settings** screen will appear. On the left side of your screen, click **Ease of Access**.
4. The **Ease of Access** screen will appear. Select a **category** from the menu on the left, then **adjust or enable** your setting on the right. In our example, we've selected the **Keyboard** category on the left and enabled the **Sticky Keys** feature on the right.

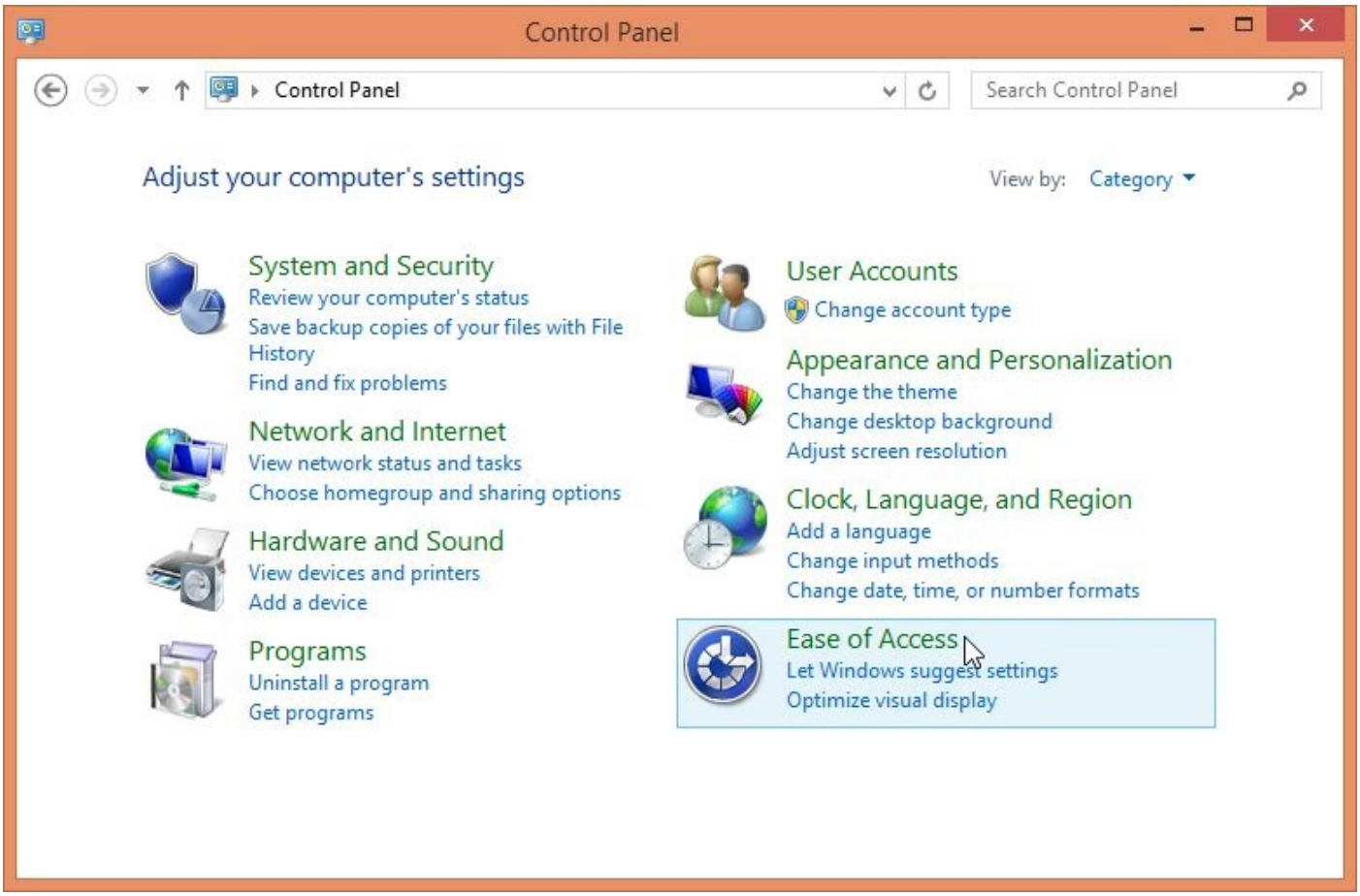


To find accessibility features in Windows 7 or earlier:

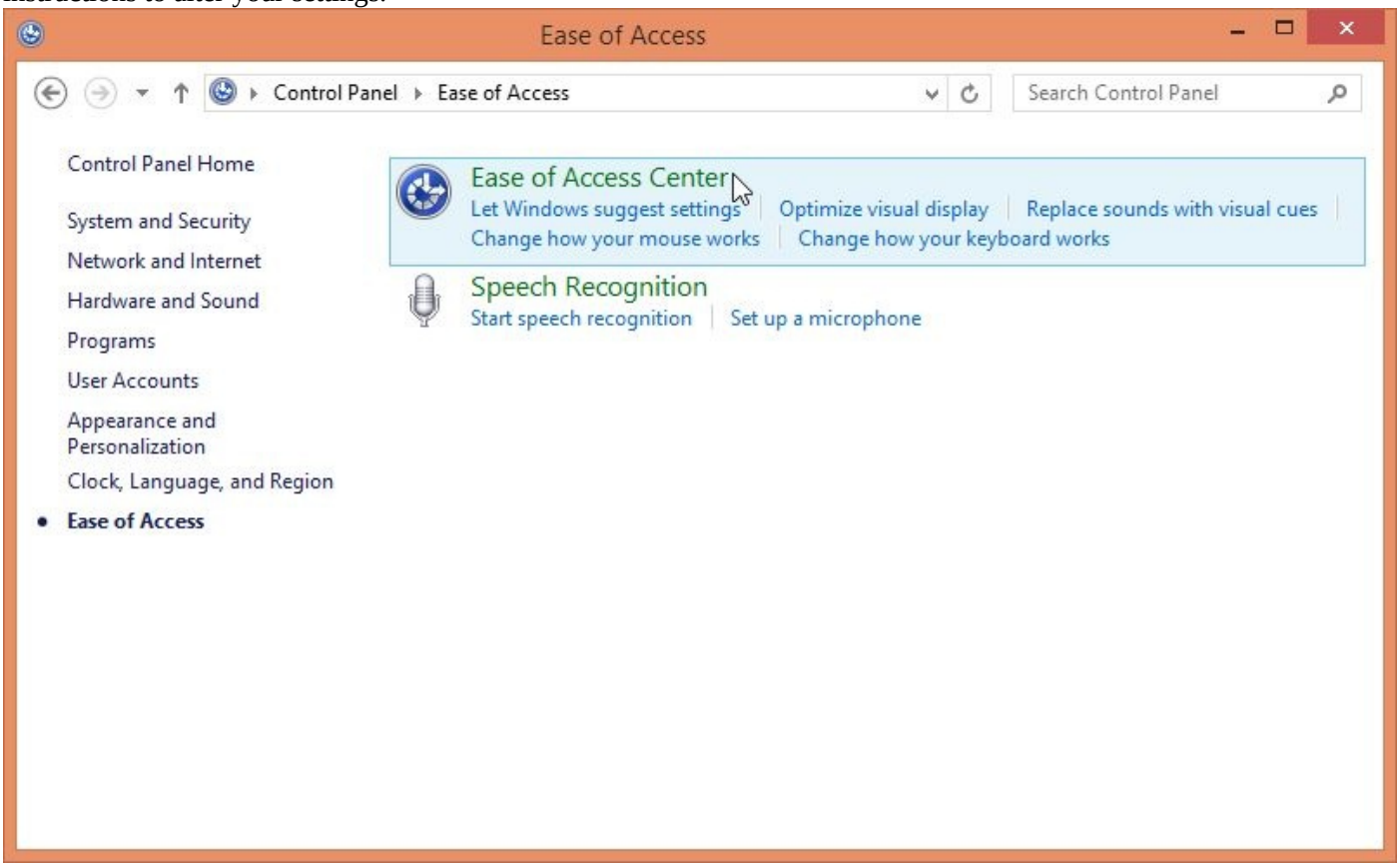
1. Click the **Start** button, then select **Control Panel**.



2. The **Control Panel** will appear. Click **Ease of Access**.



3. The **Ease of Access** screen will appear. From there, you can choose a category and follow instructions to alter your settings.

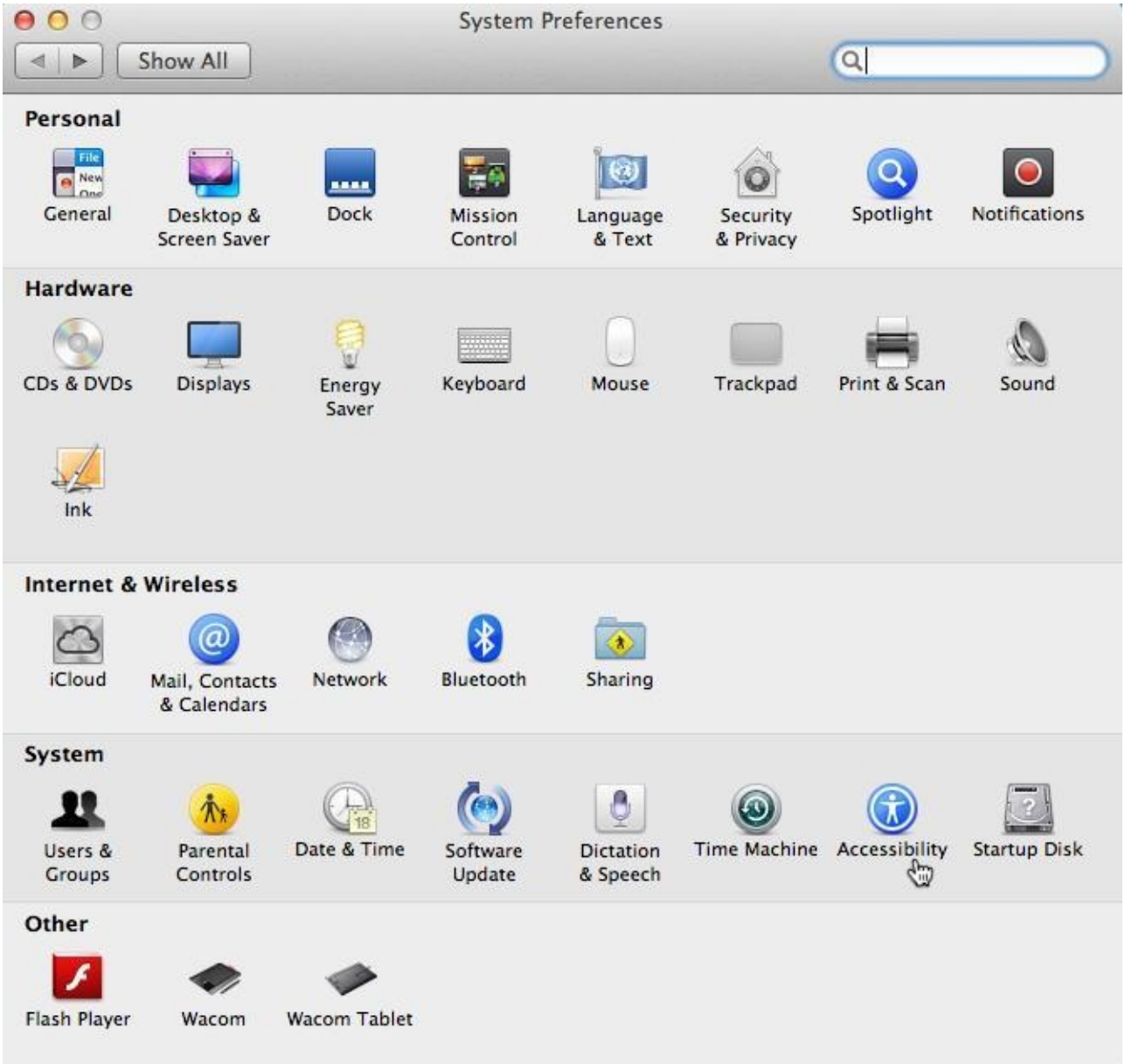


Most operating systems also include a few accessibility features in the **Display** menu, so you can check there if you can't find the feature you're looking for. The **Display** menu can usually be accessed through the **Control Panel** or **Settings** menu.

To find accessibility features in OS X:

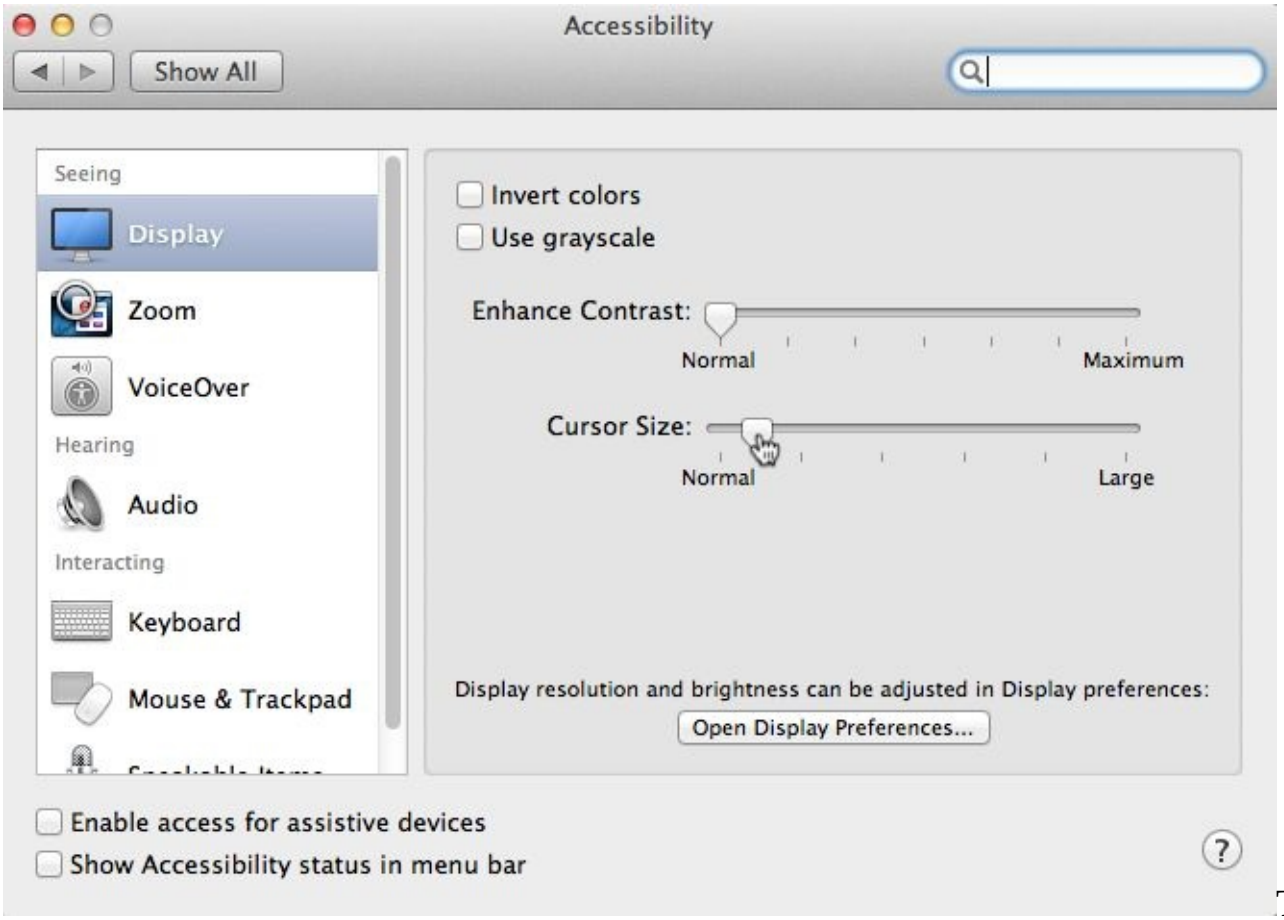
1. Click the **Apple** icon in the top-left corner of your screen and select **System Preferences**.

2. The **System Preferences** menu will appear. Click the **Accessibility** icon near the bottom of the menu. **Note:** In older versions of OS X, accessibility is called **Universal Access** and is located in the upper-right corner.



3. The **Accessibility** window will appear. Click a category in the **left-hand menu**, then adjust your setting on the **right**.

In our example, we've clicked **Display**, then adjusted the **cursor size** on the right.



To access the **dictation** and **text-to-speech** features, click **Dictation & Speech** in the **System Preferences** menu.

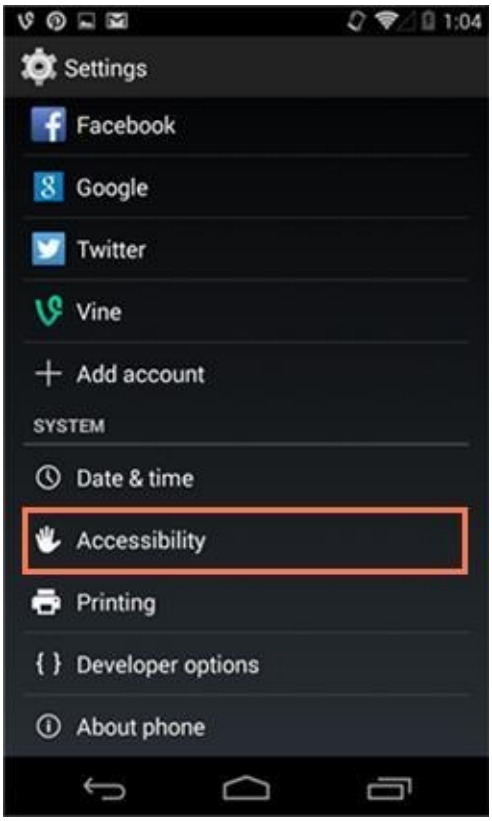
Finding accessibility features on your mobile device

On mobile devices, as on computers, accessibility features can generally be found and adjusted by navigating to the **Accessibility** menu. Note that some accessibility features, like **voice recognition**, may appear in their own menus instead of in the Accessibility menu.

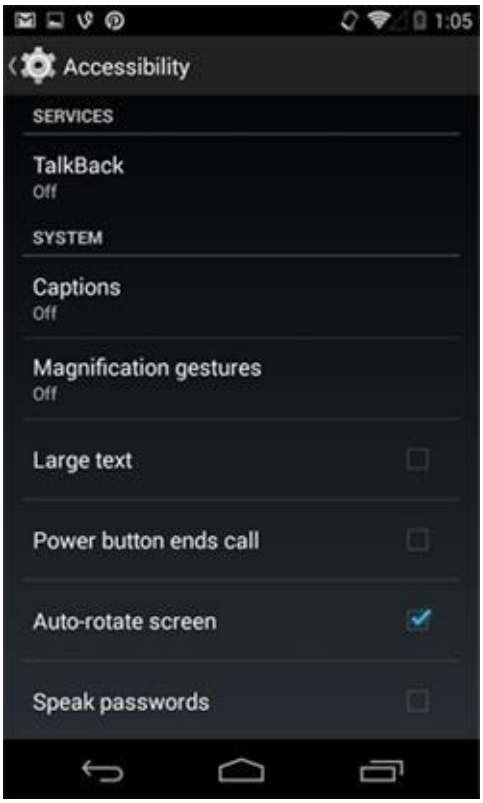
To find accessibility features on Android:

1. Locate and select **Settings** on your phone or tablet.

2. The **Settings** menu will appear. Select **Accessibility**.

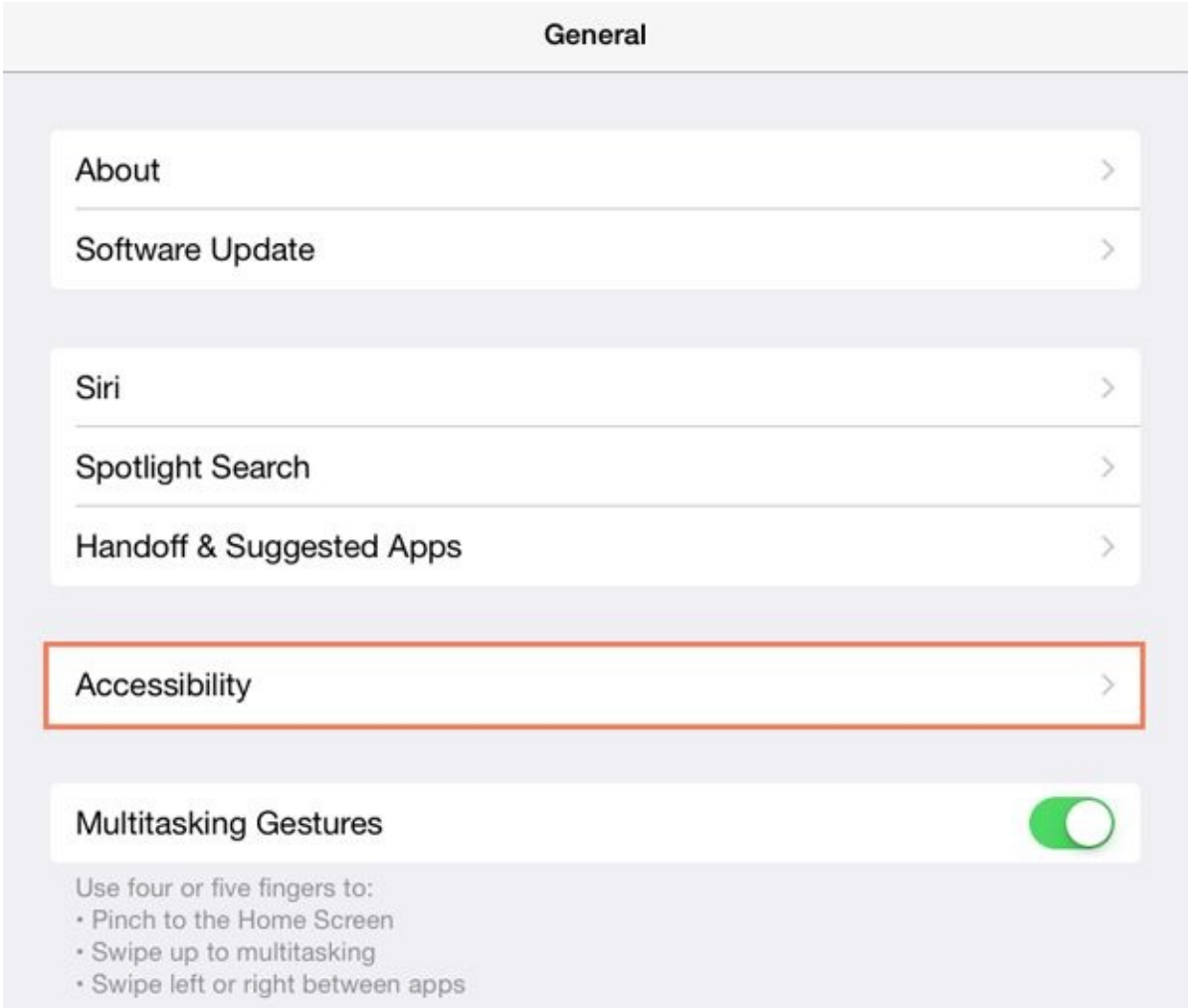


3. The **Accessibility** menu will appear. Here, you can enable the **TalkBack** feature, which provides **audio narration** for visual cues on the screen. Depending on the type of device you're using, you may be able to adjust other accessibility features here as well.

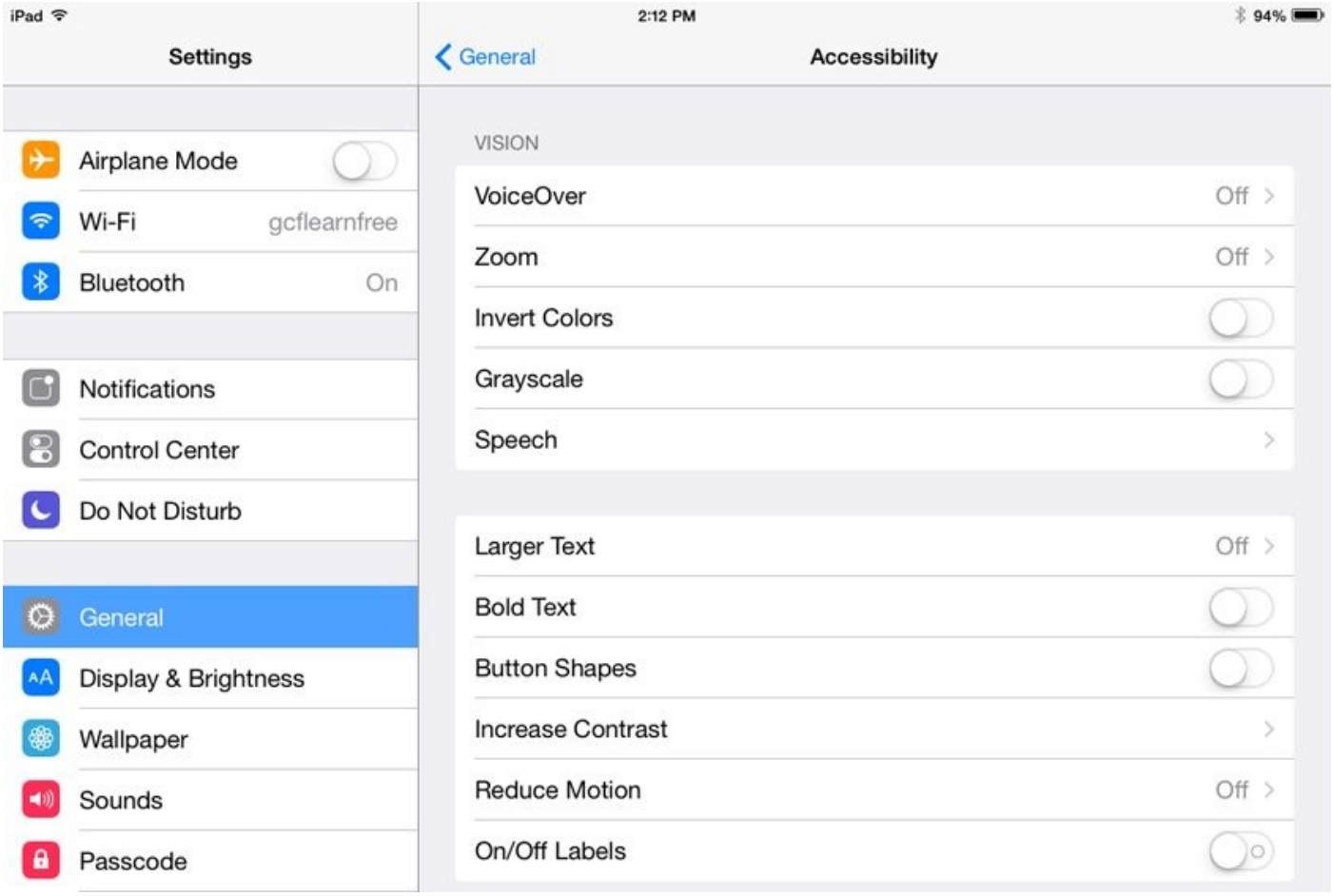


To find accessibility features on iOS:

1. Tap the **Settings** icon on your **Home** screen, then tap **General**.
2. **General** settings will appear. Tap **Accessibility**.



3. The **Accessibility** screen will appear. If the setting you want to adjust has a **toggle** next to it, you can switch it to green to turn it on. Otherwise, **tap the setting** and follow the instructions on the next screen to adjust it.



Navigating the Web with accessibility features

In addition to your computer's built-in accessibility features, most browsers offer their own. Some of the most common ones include the ability to **zoom** in and out when viewing a webpage, display webpages in **custom colors or fonts**, and **navigate webpages with the keyboard**—also called **caret browsing**.

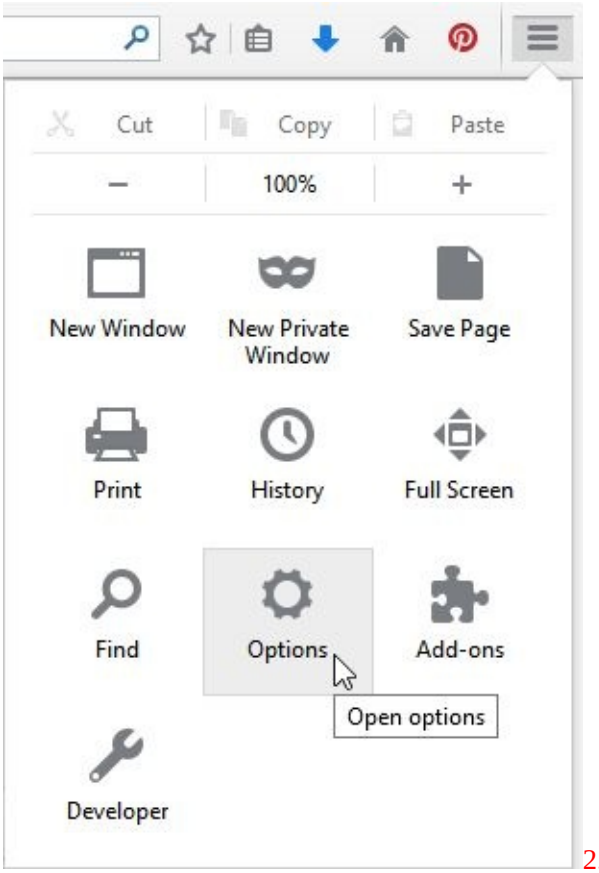
Zooming

Before you start adjusting your browser's settings, you may want to try **zooming**. Zooming is an easy way to make webpages easier to read, and it works the same way in most browsers. If you're using a browser in **Windows**, you can **zoom in or out** by pressing **Ctrl+** or **Ctrl** (hold down the **Ctrl** key and press the **+** or **-** key). If you're using a Mac, you'll press **Command+** or **Command**.

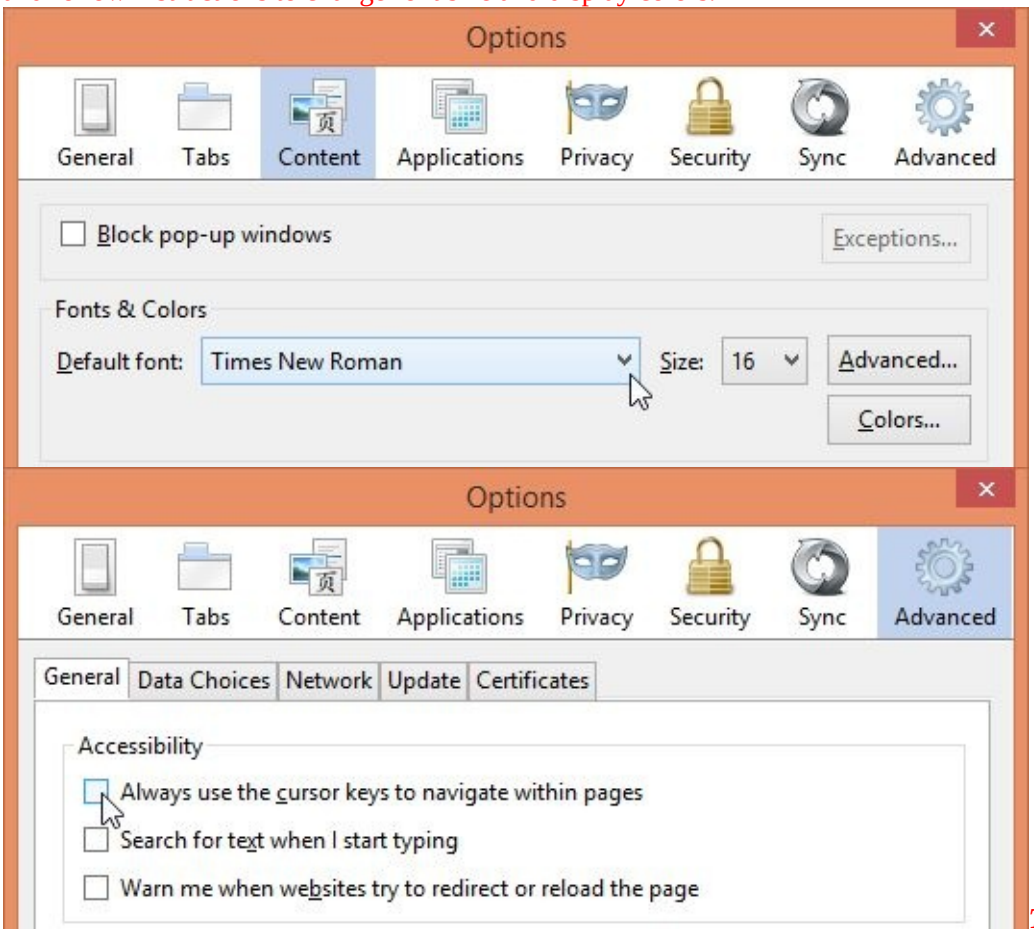
To return to the default zoom level, press **Ctrl+0** (hold down the **Ctrl** key and press the **zero** key). If you're using a Mac, press **Command+0**.

To find accessibility features in Firefox:

1. Click the **Firefox menu** in the top-right corner of the browser, then select **Options**. 3. To navigate the Web using the keyboard, click **Advanced** in the top menu and select **Always use the cursor keys to navigate within pages**.

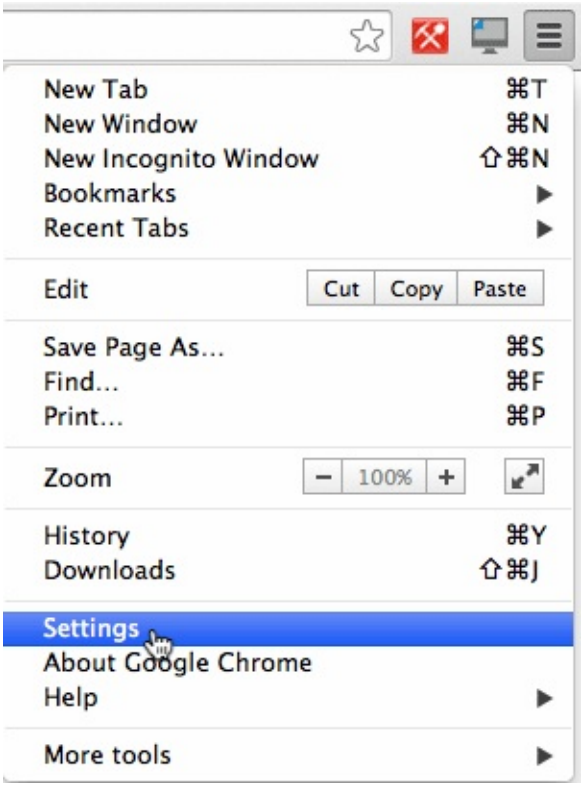


2. The **Options** dialog box will appear. Click **Content** in the top menu and follow instructions to change font size and display colors.



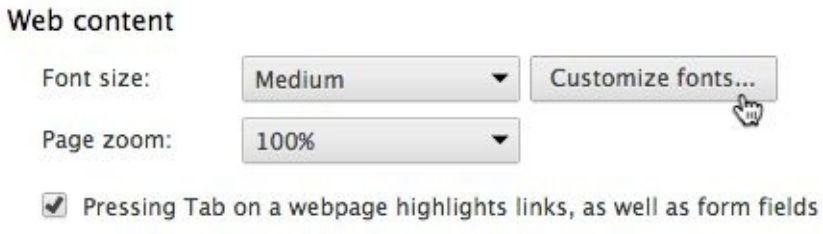
To find accessibility features in Chrome:

1. Click the **Chrome menu** in the top-right corner of the browser, then select **Settings**.



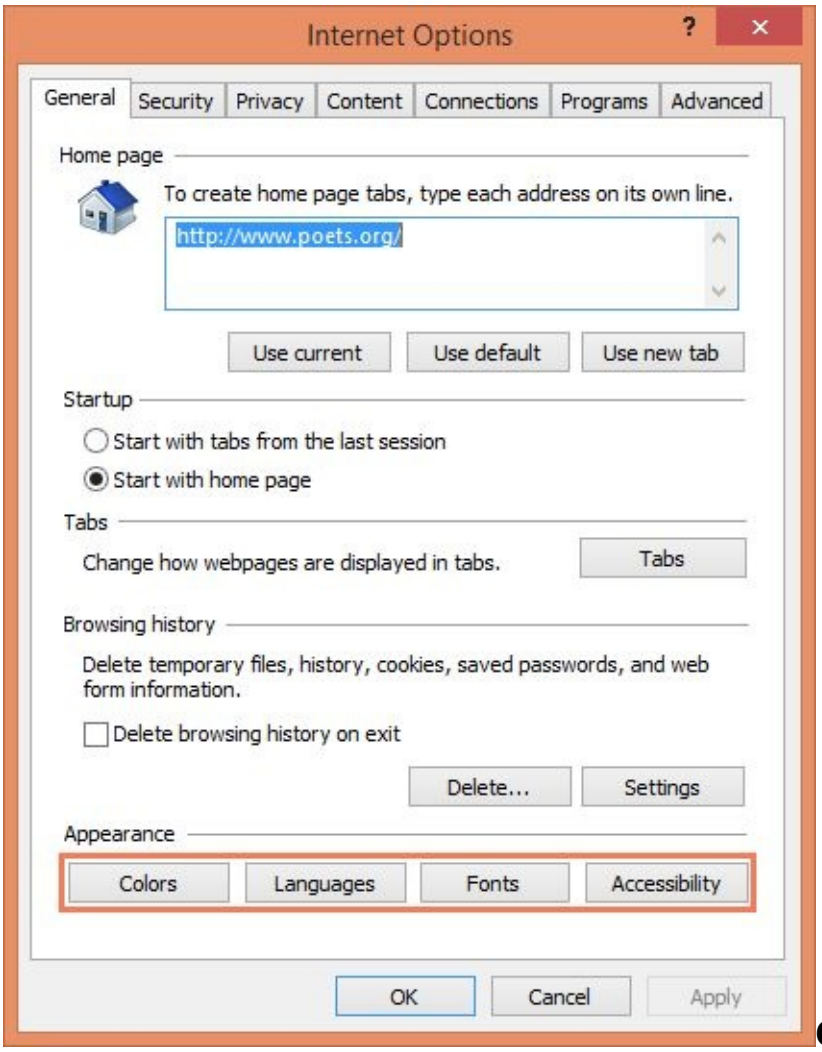
2. The **Settings** tab will appear. Click **Show advanced settings**.

3. The **Settings** options will expand. Scroll down to **Web Content**, where you can customize font size and color, zoom in on webpages, and choose to navigate links on webpages using the **Tab** key.



To find accessibility features in Internet Explorer:

1. Click the **Tools** menu at the top-left of the screen. If you don't see the **Tools** menu, click the **gear icon** at the top-right. Select **Internet options**.
2. The **Internet Options** dialog box will appear. To customize the fonts and colors used to display webpages, click the **Font** or **Color** button and follow the instructions on the screen.



Caret browsing, which allows users to navigate webpages with the keyboard, can be activated in Internet Explorer by pressing the **F7** key.

To find accessibility features in Safari:

1. Click the **Safari** menu in the upper-left corner of your screen, and select **Preferences**.

2. A dialog box will appear. Click **Advanced** in the top-right corner.

3. From here, you can set a **minimum font size** for webpages or choose to navigate webpages using the **Tab** key.

Adding accessibility features to your browser

In addition to their **pre-installed** accessibility features, some browsers also have features that can be added by installing **add-ons**, **extensions**, or **apps**. To learn more about how to install these, check out our lessons on Customizing Firefox, Customizing Chrome, and Customizing Internet Explorer.

Assistive technology devices

As you've already seen, **software** can do a lot to make computers more accessible to disabled users. However, some accessibility features require extra **hardware**, or **assistive technology**. Most assistive-technology devices are similar to keyboards and speakers—they are **peripherals** that can be plugged into the main computer. Here are some common types of assistive technology you may encounter.

Screen magnifiers: Screen magnifiers can be placed over your computer's monitor to ensure the content on the screen always appears magnified. Today, most people use the magnifier or zoom features on their operating systems to view content, but external magnifiers are still available as well.

Alternative keyboards: For people who have difficulty using standard keyboards, there are a range of **alternative options**. For example, users can purchase keyboards with **larger keys** that are easier to see or press. They can also buy keyboards with **alternative key arrangements**, including arrangements for people who can only type with one hand or with a limited number of fingers.

Switch-adapted peripherals: Switch devices allow people with limited mobility to control technology with very **small motions**, such as a puff of breath or a head movement. **Switch-adapted mice and keyboards** make it possible for disabled users to interact with computers even if they are unable to operate peripherals with their hands.

More accessibility resources For more information on accessibility in specific software —or to find out more about assistivetechnology options—check out the links below.

Accessibility features in specific software

Accessibility Features in Firefox: This is Mozilla's official help site for Firefox's accessibility features.

Apple Accessibility: This is Apple's overview site for accessibility features on Macs, iPods, iPhones, and iPads. From here, you can navigate to help documents for specific features.

AppleVis: This community-based website offers tips, tutorials, and product reviews for blind and low-vision users of Apple products.

Google Accessibility: This is Google's help site for accessibility features on Android phones and tablets and in Chrome.

Microsoft Accessibility: Here, you'll find news on Microsoft's accessibility projects, as well as help pages on accessibility features in the Windows operating system and in the Microsoft Office suite.

TutsPlus: OS X Accessibility 101: This tutorial offers in-depth explanations of accessibility features in the OS X operating system.

Assistive technology devices

Ablenet: Computer Access: Here, you can purchase a wide range of assistive-technology devices.

You'll also find information on what types of devices are useful for specific disabilities. Compusult: Computer Access for Physical Disabilities: Compusult offers assistive and other kinds of technology to individuals and businesses. It also provides training courses on assistive technology.

Inclusive Technology: Here, you'll find assistive-technology products, as well as educational software designed for K-12 students with disabilities.

Other resources

Alliance for Access to Computing Careers: This website offers information on accommodations and accessible design that can be useful for teachers and students in technology fields.

My Web My Way: This site was created by the BBC. Here, you can find detailed guides on how to change a variety of settings to make your computer more accessible and easier to use.

National Center for Learning Disabilities: Here, you'll find useful information on learning disabilities, assistive technology, and appropriate accommodations for work and school.

Tech-Ease for All: This site has resources for teachers and parents who want to use technology and computers with disabled students.

More resources Want to continue learning about computers? Check out these tutorials from our site and from around the Web.

Our tutorials:

Windows Basics

OS X Basics

Internet 101

Internet Safety

Tech Savvy Tips and Tricks

Other sites with useful tutorials:

EveryoneOn

Northstar Digital Literacy Project Learn My Way

BBC WebWise

In Pictures

Tech Tutorials