Computer Basics
Basic Parts of a Desktop Computer

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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.

Watch the video (2:08). Need help?

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), the 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 completely eliminates the tower.

A computer case

An all-in-one iMac

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** (light-emitting 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 bigger and heavier, and they take up more desk space.
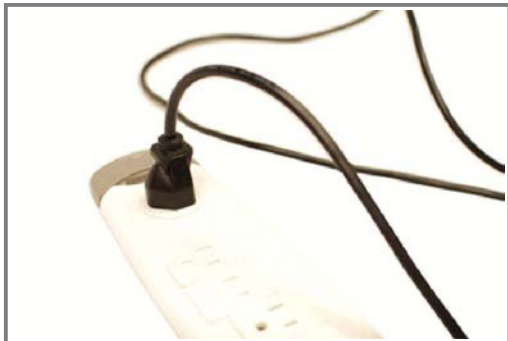
Most monitors have **control buttons** that allow you to change your monitor's display settings, and some monitors also have built-in speakers.

A monitor

LED displays are actually **LCD** displays that are **backlit** with light-emitting diodes. This allows for **greater contrast** than a traditional LCD display.

Power Cord

A power cord connected to a surge protector

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 into a **surge protector**. You can also use an **Uninterruptable Power Supply (UPS)**, which acts as a surge protector and also 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 such as wired, wireless, ergonomic, multimedia, and more. Although there may be differences in the location of some keys or features, keyboards are **very similar** and allow you to
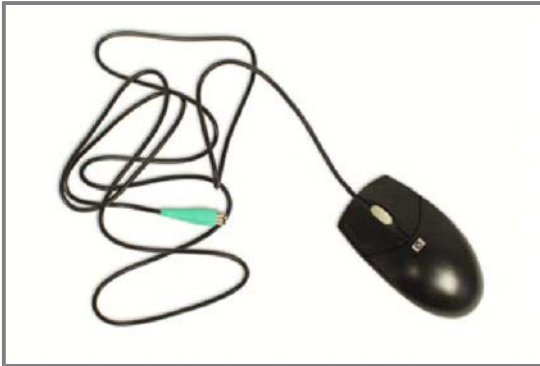
accomplish basically the same tasks.

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

>>> If you want to improve your typing skills, check out our blog article [5 Free Sites for Learning How to Type](#).

Mouse

A 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 cheaper, 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 a mouse can do, but with 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 simply 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 very common on laptop computers.

A touchpad on a laptop

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 **Parts of the Keyboard** interactive on page 3 of this lesson. Are there any keys that 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**.

Computer Basics
Buttons, Sockets and Slots on a Desktop 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 that new printer, mouse, digital camera, or other device.

Watch the video (3:07). Need help?

>>> 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 vary from computer to computer, and many companies have their own special connectors for the 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 that 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 that you don't recognize, consult your manual for more information.

>>> Now you try it! Practice connecting the cables with an interactive game.

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, or 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/copier, although you can also buy a separate **flatbed** or **hand-held** scanner.

A printer

- ❖ **Speakers/Headphones: Speakers** and **headphones** are output devices, which means that 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.

Computer 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** or take **pictures**. It can also transmit video over the internet in **real time**, allowing you to do **video chat** or **video conferencing** with somebody 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 various other types of controllers that 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, that 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.

A webcam

Challenge!

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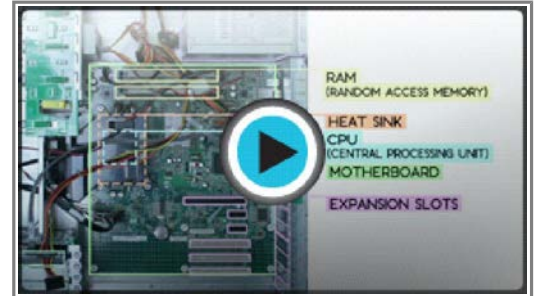
Inside a Desktop Computer

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 little about what goes on inside the computer casing.

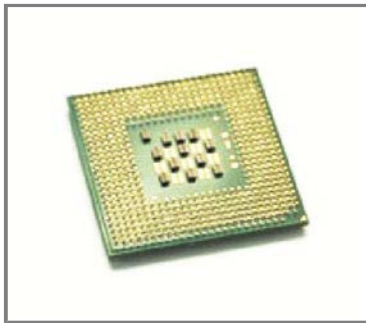>>> Watch the video to learn about what's inside a desktop computer.

Watch the video (2:19). Need help?

A Look Inside a Desktop Computer

Let's explore the inside of a computer tower.

CPU/Processor

A CPU

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 **2-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

A 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, as well as connections to your computer's ports (such as the 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 the 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.

A power supply unit

RAM (Random Access Memory)
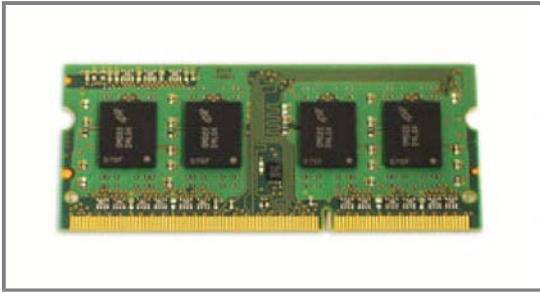
RAM

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.

A **bit** is the smallest unit of data in computer processing. A **byte** is a group of eight bits. A **megabyte** contains about one million bytes, and a **gigabyte** is about one billion bytes.

Hard Drive

The **hard drive** is the **data center** of the computer. This 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** so that it can access the data more easily. 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.**

Most hard drives are **hard disk drives**, which store data on a **magnetic platter.** Some computers now use **solid-state drives** (also called **flash hard drives**). These are faster and more durable than hard disk drives, but they are also more expensive.

A hard drive

A **USB flash drive** is basically a small, removable flash hard drive that plugs into a USB port. These are a convenient way to **bring your files with you** and open them on a different computer.

If you're using Windows, you can view information about your computer's **RAM** and **processor speed** without opening up your computer. Just go to the **Control Panel** (in the **Start menu**) and click **System and Security.** In Mac OS X, you can view this information by clicking the **Apple icon** and selecting **About This Mac.**

Expansion Cards

Most computers have **expansion slots** on the motherboard that allow you to add various types of **expansion cards**. These are sometimes called **PCI (Peripheral Component Interconnect) cards**. You may never have to add any PCI cards, as most motherboards have built-in video, sound, network, and other capabilities. However, if you want to boost the performance of your computer or update the capabilities of an older computer, you can always add one or more cards. Below are some of the most common types of expansion cards:

Video card

The **video card** is responsible for **what you see** on the monitor. Most computers have a **GPU (Graphics Processing Unit)** built into the motherboard, instead of having a separate video card. If you like playing graphics-intense games on the computer, you can add a faster video card to one of the **expansion slots** to get better performance.
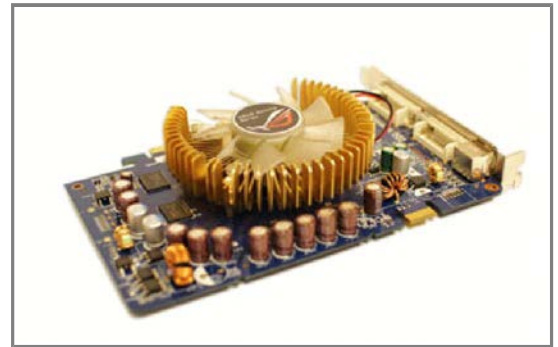
A video card

Sound Card

The **sound card**, also called an audio card, is responsible for **what you hear** in the speakers or headphones. Most motherboards have integrated sound, but you can upgrade to a dedicated sound card for higher quality sound.

Network Card

The **network card** allows your computer to communicate over a network and access the internet. It can either connect with an **Ethernet** cable or through a **wireless** connection (often called **Wi-Fi**). Many motherboards have built-in network connections, and a network card can also be added to an expansion slot.

Bluetooth Card

A Bluetooth dongle

Bluetooth is a technology for wireless communication over short distances. It's often used in computers to communicate with wireless **keyboards**, **mice**, and **printers**. It's often built into the motherboard or included in a **wireless network card**. For computers that don't have Bluetooth, a USB adapter (called a **dongle**) can be purchased.

Challenge!

- Review the **parts of the computer** identified in this lesson. Make sure you know the function of each part.
- Which parts provide **short-term** and **long-term** memory for your computer?
- **Think Creatively!** In the videos, we compared the CPU to a brain, the hard drive to a closet, and the motherboard to a blueprint. Can you think of any other good analogies, or comparisons? Do any of the computer parts listed remind you of anything else?
- Find out what your **processor speed** is. Is it measured in **gigahertz** or **megahertz**? How much **RAM** does your computer have?

What is a Laptop Computer?

A laptop is a battery or AC-powered 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.

Watch the video (2:19). Need help?

How is a Laptop Different From a Desktop?

Since laptops are designed for portability, there are some important differences from desktop computers. A laptop has an **all-in-one design**, with a built-in **monitor**, **keyboard**, **touchpad** (which replaces the mouse), and **speakers**. That 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.

You also have the option of connecting a regular mouse, a 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 that 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 the laptop in, the battery **recharges**. Another benefit of having a battery is that it can provide **backup power** to the laptop if

A touchpad on a laptop

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 particular kind 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 that 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**.

An AC adapter plugged into a laptop

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

What is a Netbook?

A **netbook** is a type of laptop that is designed to be **even more portable.** Netbooks are often **cheaper** than laptops or desktops. They are generally **less powerful** than other types of computers, but they provide enough power for **email** and **internet access**, which is where the name "netbook" comes from.

In order to save space, netbooks generally have smaller **screens** and **keyboards.** Many netbooks also lack certain **hardware** such as **optical drives.** However, there are many different models available, and in some cases there isn't much difference between a large **netbook** and a "regular" **laptop.**

Using a netbook

Since netbooks are less powerful, they sometimes use a more simplified operating system. Many new netbooks use **Windows 7 Starter**, but some use simplified versions of **Linux**.

Challenge!

- If you've used a laptop computer 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 of the advantages of 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?

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 very 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 are mostly designed for **consuming media**, and they are optimized for tasks like **web browsing**, **watching videos**, **reading e-books**, and **playing games**. For many people, a "regular" computer like a **desktop** or **laptop** is still needed in order to use some programs. However, the convenience of a tablet computer means that it may be ideal as a **second computer**. Below are some of the main features that you can expect with a tablet computer:
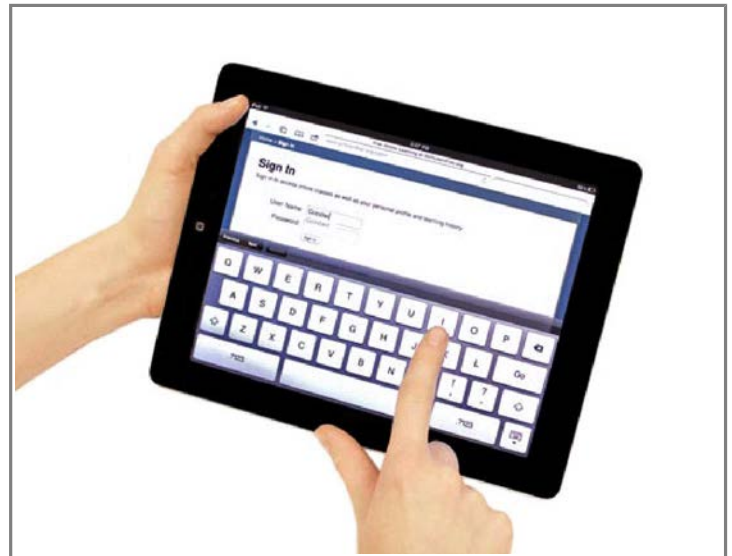
Using a virtual keyboard on an iPad

- ✦ **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:** Since 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 outdoors in full sun. Many people consider e-paper to be more pleasant to read, as 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, as the image becomes **washed out**. Since an LCD screen can display **colors**, this type of e-reader is better for viewing **magazines** or books with **photos**. Many LCD e-readers (such as the **Nook Color**) are basically **tablet computers**, as they can do many different tasks in addition to displaying e-books.

You don't need an e-reader in order to read an e-book. E-books can usually be read on **tablet computers**, **smartphones**, **laptops**, and **desktops**.
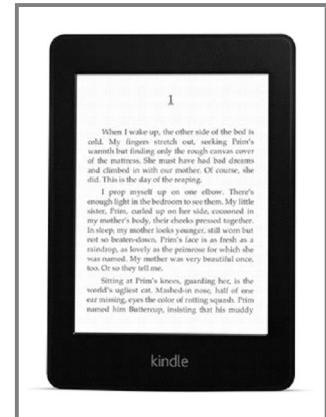
A Kindle e-reader with an e-paper display

A Nook Color with an LCD display

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 phone service. They are basically small **tablet computers**, and they can be used for **web browsing**, **watching videos**, **reading e-books**, **playing games** and more.

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

Using an iPhone

Internet access is an important feature of smartphones. Generally, you will need to purchase a **3G or 4G data plan** in addition to normal **cell service**. Smartphones can also connect to **Wi-Fi** when it is available, which is usually faster than 3G.

A **personal digital assistant (PDA)** is a mobile device that is used for managing phone numbers, addresses, calendars, and other information. Before **smartphones** existed, a PDA was usually a **separate device**. Today, smartphones combine the functionality of a **PDA** and a **mobile phone**.

Challenge!

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