

Hardware, Software, & Operating Systems

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Computer hardware, software, and an operating system require each other and neither can be realistically used without the other.

Hardware

Computer hardware is the collection of physical elements that constitutes a computer system. Computer hardware refers to the physical parts or components of a computer such as the monitor, mouse, keyboard, computer data storage, hard drive disk (HDD), system unit (graphic cards, sound cards, memory, motherboard and chips), etc. all of which are physical objects that can be touched.

What is a computer?

Page 1

A **computer** is an electronic device that manipulates information, or data. It has the ability to **store**, **retrieve**, and **process** data. You can use a computer to type documents, send email, and browse the Web. You can also use it to handle spreadsheets, accounting, database management, presentations, games, and more.

 Watch the video to learn about different types of computers.



Click on the picture to read the website. Be sure to watch the video and engage in the interactive.

Computer Basics

Basic Parts of a Desktop Computer



f 207 t 19 g+ 18 p 15

Introduction

Page 1

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.



Click on the picture to read the website. Be sure to watch the video and engage in the interactive.

Computer Basics

Buttons, Sockets and Slots on a Desktop Computer



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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.



Click on the picture to read the website. Be sure to watch the video and engage in the interactive.

Computer Basics

Inside a Desktop Computer



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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 bit more about what goes on inside a computer casing.

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

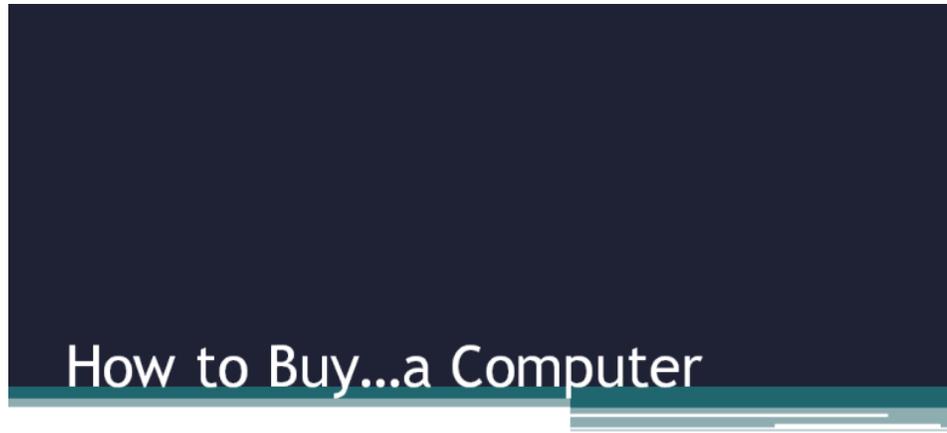


[Click on the picture to read the website. Be sure to watch the video and engage in the interactive.](#)

Assignment: Computer Hardware worksheet

Directions: Complete the online worksheet in itsLearning.

Build Your Own PC



[Click on the picture to read the presentation](#)

Assignment: Build Your Own Computer Project

Directions: you will use the Internet to select and price the components to construct your own PC (you cannot construct a MAC). You have a set budget of \$1,000. An Excel template has been provided for you. You will also construct a PowerPoint or a Prezi of your computer describing each of the components that you selected. Be sure to include the component details and the price in your presentation.

Laptops & Other Devices



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Anything I don't know how to do, I go to the site for a refresher.”

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Computer Basics

Laptop Computers and Netbooks



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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.



Click on the picture to read the website. Be sure to watch the video and engage in the interactive.



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Getting to Know Mobile Devices

Computer Basics

Getting to Know Mobile Devices



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🐦 8
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What is a mobile device?

Page 1

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**.

Click on the picture to read the website. Be sure to watch the video and engage in the interactive.

Assignment: Question for Thought 1

Directions: Think about how a tablet computer is different from a laptop. What are some of the advantages and disadvantages of a tablet computer? Type your response (~50 words) directly into the itsLearning textbox. Do not attach a separate document and be sure to proofread.

Assignment: Laptops & Other Computers worksheet

Directions: Complete the online worksheet in itsLearning.

Software

Computer software determines the tasks your computer can accomplish. Your computer includes application software that provides your computer instructions for each use and utility software or system software that is designed to help you monitor and configure settings for your computer. On virtually all computer platforms, software can be grouped into a few broad categories:

- Application software
- System software
- Malicious software

Did you know?

- 1 Byte = 8 Bit
- 1 Kilobyte (KB) = 1,024 Bytes
- 1 Megabyte (MB) = 1,048,576 Bytes
- 1 Gigabyte (GB) = 1,073,741,824 Bytes
- 1 Terabyte (TB) = 1,099,511,627,776 Bytes

The byte is a unit of digital information in computing and telecommunications that most commonly consists of eight bits.

Application software uses the computer system to perform useful work or provide entertainment functions beyond the basic operation of the computer itself.

System software is designed to operate the computer hardware, to provide basic functionality, and to provide a platform for running application software. System software includes operating systems like Windows, iOS, Android, or Mac OSX. System software also includes device drivers. Drivers are computer programs that operates or controls a particular type of device that is attached to a computer such as the mouse or DVD player. Utilities, software designed to assist users in maintenance and care of their computers.

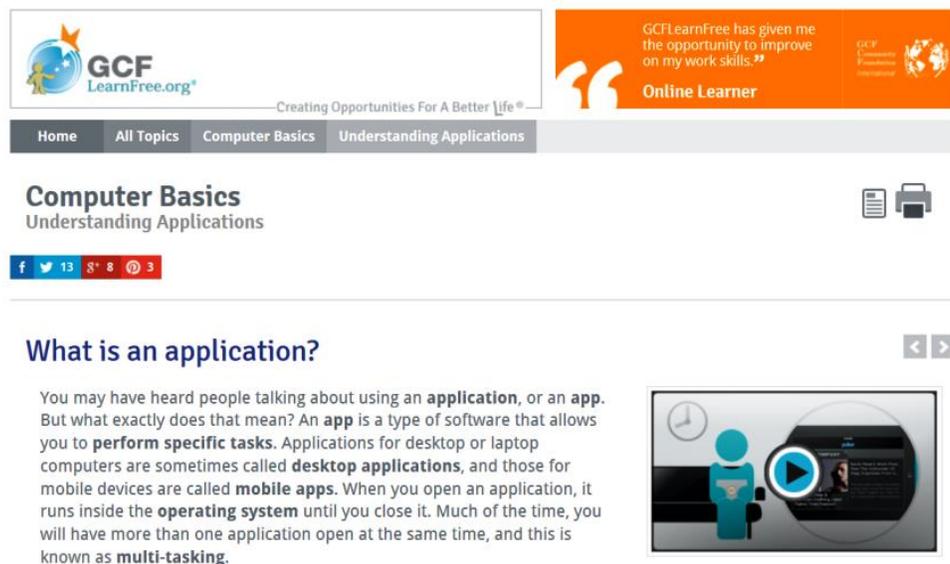
Malicious software, often referred to as malware, is computer software developed to harm and disrupt computers. Malware is undesirable and is closely associated with computer-related crimes, though some malicious programs may have been designed as practical jokes

Do you know?

- **Read-only memory** or **ROM** is a form of data storage in computers and other electronic devices that can not be easily altered or reprogrammed. RAM is referred to as volatile memory and is lost when the power is turned off whereas ROM is non-volatile and the contents are retained even after the power is switched off.
- **Random Access Memory** or **RAM** is a form of data storage that can be accessed randomly at any time, in any order and from any physical location in contrast to other storage devices, such as hard drives, where the physical location of the data determines the time taken to retrieve it. RAM is measured in megabytes and the speed is measured in nanoseconds and RAM chips can read data faster than ROM.

The software's license gives the user the right to use the software in the licensed environment. Some software comes with the license when purchased off the shelf, or an OEM license when bundled with hardware. Other software comes with a free software license, granting the recipient the rights to modify and redistribute the software. Software can also be in the form of freeware or shareware.

Some software comes bundle as a suite. For example, Microsoft Office Suite is a bundle of word processing (Word), spreadsheet (Excel) and presentation (PowerPoint). In some versions of the suite, you can also get Publisher (desktop publishing), Outlook (email), and Access (relational database). The suite is designed to work together and you can easily import and export data between the applications.

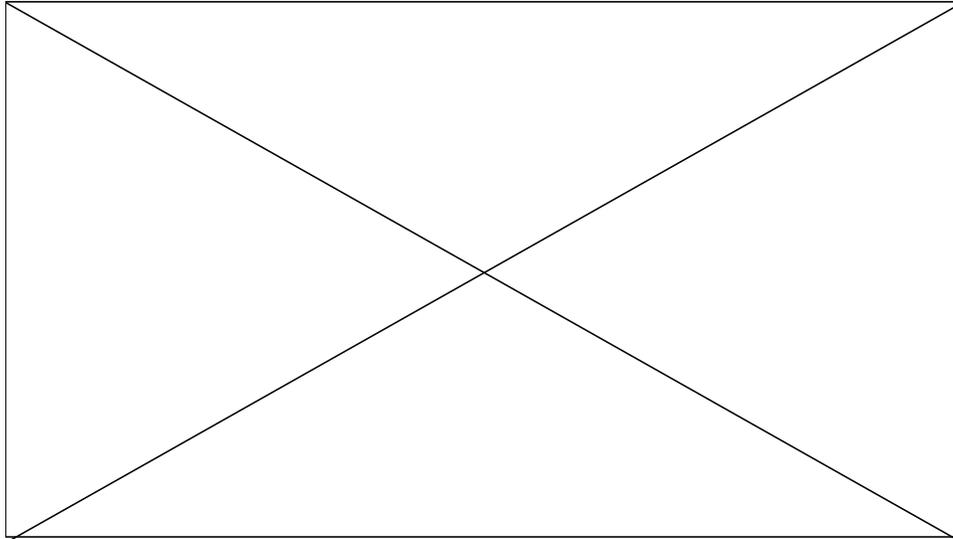


The screenshot shows the GCF LearnFree.org website. The header includes the GCF LearnFree.org logo and the tagline "Creating Opportunities For A Better Life". A navigation menu contains "Home", "All Topics", "Computer Basics", and "Understanding Applications". A testimonial banner reads: "GCF LearnFree has given me the opportunity to improve on my work skills." Online Learner. The main content area is titled "Computer Basics" and "Understanding Applications". Below this are social media icons for Facebook (13), Twitter (8), and YouTube (3). The section title "What is an application?" is followed by a paragraph explaining that an application (app) is software that allows users to perform specific tasks, distinguishing between desktop and mobile apps, and mentioning multi-tasking. To the right of the text is a video player icon with a play button.

[Click on the picture to read the website. Be sure to watch the video and engage in the interactive.](#)

Mobile Apps

A mobile app is a computer program designed to run on smartphones, tablet computers and other mobile devices. Apps are usually available through application distribution platforms, which began appearing in 2008 and are typically operated by the owner of the mobile operating system, such as the Apple App Store, Google Play, Windows Phone Store, and BlackBerry App World. Some apps are free, while others must be bought. The popularity of mobile apps has continued to rise, as their usage has become increasingly prevalent across mobile phone users. According to market research firm Gartner, 102 billion apps will be downloaded in 2013 (91% of them will be free) but they will still generate \$26 billion US dollars, up 44.4% on 2012's \$18 billion US dollars.

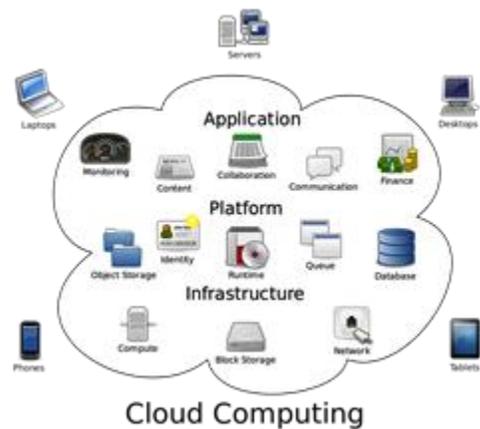


Web Apps & the Cloud

Cloud computing is a term used to refer to a model of network computing where a program or application runs on a connected server or servers rather than on a local computing device such as a PC, tablet or smartphone. A user connects with a server to perform a task. The difference with cloud computing is that the computing process may run on one or many connected computers at the same time, utilizing the concept of virtualization.

You have probably used services that are offered in the cloud such as e-mail, iTunes, or Facebook.

Many companies are now providing Software as a Service (SaaS). Instead of purchasing software on CDs at a store, you pay a monthly or annual subscription for the software and either download and install to your computer or login to a website to access the software.



Computer Basics

Web Apps and the Cloud



What is the cloud?

Page 1

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's stored on **servers** on the Internet instead of on your computer. It lets you access your **calendar**, **email**, **files**, and **more** from any computer with an Internet connection.



 Watch the video to learn about the cloud.

[Click on the picture to read the website. Be sure to watch the video and engage in the interactive.](#)

Assignment: Question for Thought 2

Directions: How can word processing, spreadsheet, presentation, and database software be used as a communication tool for business? Type your response (~100 words) directly into the itsLearning textbox. Do not attach a separate document and be sure to proofread.

Assignment: Software Comparison Chart

Directions: Create a table of software. Download the template from itsLearning.

Operating Systems

Most people do not buy their computer or mobile device for the operating system but the operating system is an essential part of the computer or mobile device. An operating system (OS) is software that manages computer hardware resources and provides common services for computer programs. Application programs usually require an operating system to function.



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Computer Basics

Understanding Operating Systems

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p 3

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.



Click on the picture to read the website. Be sure to watch the video and engage in the interactive.



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Computer Basics

Getting to Know the OS

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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 about the Windows desktop.



Click on the picture to read the website. Be sure to watch the video and engage in the interactive.

Assignment: Getting to Know Your OS worksheet

Directions: Log into itsLearning and complete the Getting to Know Your OS worksheet.

Assignment: OS Venn Diagram

Directions: Research Windows 7, Windows 8 and the latest Mac OS. Use your notes to find similarities, commonalities, and differences between all 3. Construct a 3 circle/square Venn Diagram to demonstrate your understanding of the topics. Download the complete instructions from itsLearning.

Assignment: Mobile OS Poster

Directions: Select a mobile operating system (Android or iOS) and create a 1-page promotional flyer for it. Include on your flyer: 3 benefits, 3 drawbacks, type of device it will run on, and Anything else you think would be important for promoting (getting people to want to use it) this OS. Upload your poster to itsLearning.

Emerging Technology

What is the impact of smartphones on society? Bran Ferren, Co-Founder & Chief Creative Officer, Applied Minds, talks about the impact of smartphones on society.

Take a glimpse inside the new Microsoft Envisioning Center, where visitors can experience conceptual prototypes that explore how services and devices will help us stay connected and transform the way we live, work and play. Focused on both productivity and consumer scenarios set 5 -- 10 years out, the Envisioning Center is a place where we can engage partners and engineering teams in dialog to evolve our vision.

This demo -- from Pattie Maes' lab at MIT, spearheaded by Pranav Mistry -- was the buzz of TED. It's a wearable device with a projector that paves the way for profound interaction with our environment. Imagine "Minority Report" and then some.

MIT grad student David Merrill demos Siftables — cookie-sized, computerized tiles you can stack and shuffle in your hands. These future-toys can do math, play music, and talk to their friends, too. Is this the next thing in hands-on learning?

Assignment: Current Technology discussion board

Directions: Find a current technology that you think is really cool. Start a new thread on the itsLearning discussion board and tell the class why you think this technology is a great tool. Include the URL so other people can go check it out.

Assignment: Cloud Computing Comparison

Directions: Using the PowerPoint and the Internet, create a comparison of the features of three different cloud computing providers. Compare the following items on each of the providers you look at to compare. You need to add a few items of your own to the list! This should simply get you started! Please also include a definition of Cloud Computing somewhere on your page! You choose which software you want to do your comparison with (Word, Excel, PowerPoint, Prezi, or even Glogster!) You must also include a picture (icon) of each of the providers! ? Please note, you are also ranking the cloud computing providers as well as providing actual customer reviews that you find online! Download the full assignment from itsLearning.

Assignment: Emerging Technology Project

Directions: Emerging technology is technology that is fairly new and has not yet been adapted by the mainstream public. Examples in the past have included, Twitter, Facebook, Mobile Wallet, iTunes, GPS, RFID, Q codes, Teleconference, etc. Review this website: [The Top 10 Emerging Technologies for 2014](#). Download the full project from itsLearning.

Resources

If you are having problems viewing this page, opening videos, or accessing the URLs, the direct links are posted below. All assignments are submitted in itsLearning. If you have having problems, contact Mrs. Rush through the itsLearning email client.

GCF lesson websites: <http://www.gcflearnfree.org/computerbasics>

Build Your Own PC: <http://www.mrsrush.net/idt/hardware/computer.pdf>

Mobile Apps video: <http://bcove.me/rfh3w4d8>

The Top 10 Emerging Technologies for 2014: <http://forumblog.org/2014/02/top-ten-emerging-technologies-2014/>

Microsoft's New Envisioning Center: <http://www.youtube.com/watch?v=ho00x7ZvDLw>

Pattie Maeb video: http://www.ted.com/talks/pattie_maes_demos_the_sixth_sense

David Merrill Toy Tiles video:

http://www.ted.com/talks/david_merrill_demos_siftables_the_smart_blocks

What is the Impact of Smartphones on Society: <http://www.discovery.com/tv-shows/curiosity/topics/b-ferren-what-is-the-impact-of-smartphones-on-society.htm>

Transcript: <http://mrsrush.net/hardware/index.pdf>

Credits

[Transcript of this lesson](#)