Chapter 16:

Intellectual Property Rights, Ethics, Health, Access, and the Environment
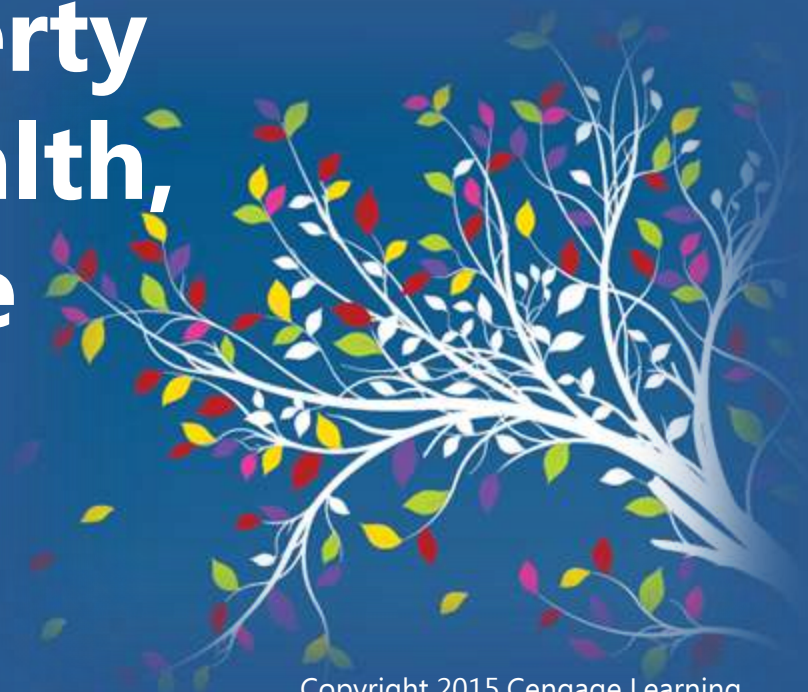
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Charles S. Parker

Learning Objectives

1. Understand the different types of intellectual property rights and how they relate to computer use.

2. Explain what is meant by the term *ethics* and provide several examples of unethical behavior in computer-related matters.

3. Describe some possible physical and emotional health risks associated with the use of computers.

4. Discuss the impact that factors such as nationality, income, race, education, and physical disabilities may have on computer access and use.

Learning Objectives

4. Suggest some ways computer users can practice *green computing* and properly dispose of obsolete computer equipment.

5. Discuss the current status of legislation related to intellectual property rights, ethics, access, and the environment in relation to computers.

Overview

- This chapter covers:
  - Various types of intellectual property rights
  - A discussion of ethics, including ethical use of copyrighted material, ethical uses of resources and information, unethical use of digital manipulation, and ethical business practices and decision making
  - The impact of computers on our physical and emotional health
  - Issues related to equal access
  - The impact of computers on our environment
  - A look at legislation related to these issues

Intellectual Property Rights

- Intellectual Property Rights
  - Rights to which creators of original creative works are entitled
  - Indicate who has the right to use, perform, or display a creative work
  - Indicate how long the creator retains rights to the property
  - Examples of intellectual property
    - Music and movies; paintings, computer graphics, and other works of art; poetry, books, and other types of written works; symbols, names, and designs; inventions

Intellectual Property Rights

- Copyrights
  - Form of protection available to the creator of original artistic or literary works
  - Last until 70 years after creator's death
  - For corporate copyrights or anonymous works, last 95 years from date of publication or 120 years from date of creation, whichever is shorter
  - Can be registered with U.S. Copyright Office

FIGURE 16-1

Copyright statements. Are often included on books, Web sites, and other original copyrighted works.

Intellectual Property Rights

- – Recent issue: Termination rights granted to musicians and songwriters
  - Can request rights back after 35 years
- – Digital Watermarks
  - Subtle alteration of digital content that is not noticeable but can identify the copyright holder
  - Can be used with images, music, movies, etc.
- – Digital Rights Management (DRM) Software
  - Used to protect and manage the rights of creators of digital content such as art, music, photographs, movies
  - Can control use of downloaded content (number of devices a file can be copied to, expiration of video-on-demand movie, etc.)

Intellectual Property Rights

The invisible watermark is embedded into the photo.

The information contained in the watermark can be viewed using an image editing program.

Digimarc ID: 507987
Copyright Year(s): 2009
Image Attributes: Restricted Use, Do Not Copy

FIGURE 16-2
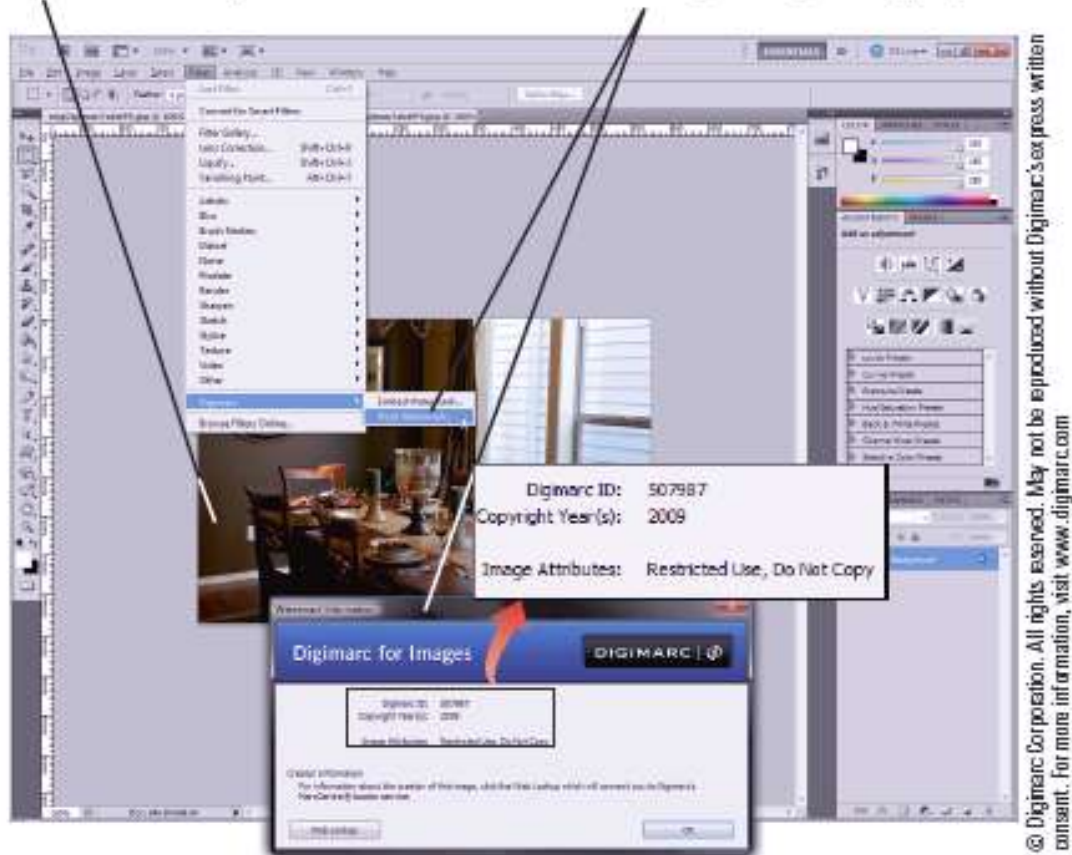Digital watermarks.

Inside the Industry Box

New Applications for Digital Watermarking

- – Digimarc Discover is one example
- – Enables mobile devices to recognize media in your immediate surroundings to provide related online content
  - – Product ads
  - – Songs
  - – Magazine articles
- – Can be implemented without taking up valuable space on resource like is required with a QR code

Intellectual Property Rights

- Trademarks
  - A word, phrase, symbol, or design that identifies goods or services
  - Trademark used to identify a service is called a service mark; service marks claimed but not registered may use the ^{sm} mark
  - Trademarks claimed but not registered may use the ™ mark; registered trademarks use the ® mark
  - Includes protection for domain names
  - Domain name disputes can be brought to the World Intellectual Property Organization (WIPO)

Intellectual Property Rights

FIGURE 16-3
Examples of trademarked logos.

Intellectual Property Rights

- Patents
  - Protect inventions
  - Last for 20 years
  - Can also protect a practice or procedure
    - Google's for "pay-for-gaze" advertising
    - Amazon.com's one-click purchase procedure
  - Expensive and difficult to obtain but can be very lucrative

FIGURE 16-4

Patents. The patent shown here is for a new e-book menu system.

Courtesy of the Office of the Chief Communications Officer, United States Patent and Trademark Office
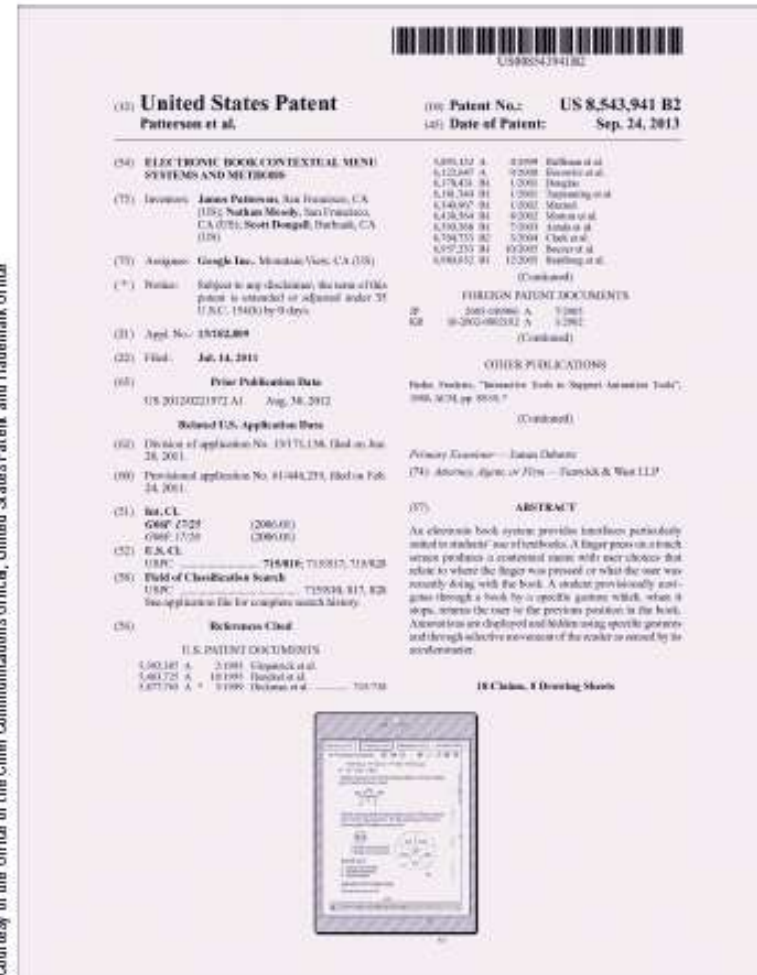
Quick Quiz

1. Copyrights are valid for _____.

    a. 70 years after the creation of the work

    b. 70 years after the publication of the work

    c. 70 years after the death of the creator

2. True or False: Logos cannot be trademarked, just the names of companies or products.

3. _____ are used to protect inventions.

Answers:

1) c; 2) False; 3) Patents

Ethics

- Ethics
  - Overall standards of moral conduct
  - Can vary with individual and religious beliefs, country, race, or culture
  - Personal Ethics
    - Guide an individual's personal behavior
  - Business Ethics
    - Guide an individual's workplace behavior
  - Computer Ethics
    - Concern moral conduct related to computer use
  - Individuals and businesses need to make ethical decisions every day

Technology and You Box

Virtual Currency—Real or Not?

- Linden dollars, World of Warcraft gold, Facebook Credits, Nintendo Points, Amazon Coins, Bitcoins, etc.

- Issue: Is it real currency?

- Recent decision: Bitcoins are a form of money, in the same way gold and silver are recognized as money

- Taxability of virtual profits is another issue

    - Some countries tax it

These physical Bitcoins each have a unique code that can be used to retrieve virtual Bitcoins online.

Courtesy Casascius

Ethics

- Ethical Use of Copyrighted Material
  - Books and Web-Based Articles
    - Need to properly credit sources to avoid plagiarism
    - Plagiarism is a violation of copyright law and an unethical act
    - Strict consequences for plagiarism at school and work
    - Online tests for plagiarism are available and widely used by schools

Ethics

PLAGIARISM	NOT PLAGIARISM
A student including a few sentences or a few paragraphs written by another author in his essay without crediting the original author.	A student including a few sentences or a few paragraphs written by another author in his essay, either indenting the quotation or placing it inside quotation marks, and crediting the original author with a citation in the text or with a footnote or endnote.
A newspaper reporter changing a few words in a sentence or paragraph written by another author and including the revised text in an article without crediting the original author.	A newspaper reporter paraphrasing a few sentences or paragraphs written by another author without changing the meaning of the text, including the revised text in an article, and crediting the original author with a proper citation.
A student copying and pasting information from various online documents to create her research paper without crediting the original authors.	A student copying and pasting information from various online documents and using those quotes in her research paper either indented or enclosed in quotation marks with the proper citations for each author.
A teacher sharing a poem with a class, leading the class to believe the poem was his original work.	A teacher sharing a poem with a class, clearly identifying the poet.

FIGURE 16-5
Examples of what is and what is not normally considered plagiarism.

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Ethics

– Music
- Debate began with Napster
- Concerns still exist about P2P file sharing sites
  – Downloading a music file from a P2P site without compensating the artist and record label is violation of the copyright law and an unethical act
- Copying purchased songs for personal, non-commercial use usually considered within the fair use concept
- DRM controls can impact downloaded files, purchased CDs, etc.
- Many downloads today are DRM-free MP3 formats
- RIAA suing individuals for illegal downloads

Ethics

- Once music is obtained legally, transferring those songs to other devices is typically viewed as fair use
- Many apps available to legally listen to music on demand
  - E-Books
    - In 2011, sales of e-books at Amazon.com exceeded print books
    - Piracy of e-books is growing quickly

FIGURE 16-7

Music apps. Allow you to legally listen to music on demand on your devices.

Ethics

- Movies
  - Movie piracy is rampant
  - New issues such as sharing VOD movies or recorded TV show
  - Distributing bootleg copies of movies is illegal and unethical
    - Often happens via the Internet
  - Many legal online alternatives are available
    - Often contain DRM tools to prevent unauthorized use

Ethics

- FBI Anti-Piracy Seal is used with movie DVDs, music CDs, and other intellectual properties commonly pirated

FIGURE 16-8
Amazon Instant Video. Allows you to legally download (buy) or stream (rent) movies and TV shows to your TV, computer, or mobile device.

Courtesy Amazon

FIGURE 16-9
The FBI Anti-Piracy Warning Seal.

Federal Bureau of Investigation. Used with permission.

How It Works Box

Digital Copy Movies

– Allow you to install a copy of a purchased movie on a mobile device

1. The movie includes a Digital Copy—insert the disc into your computer.

2. Follow the on-screen instructions to activate your Digital Copy and transfer the movie to your computer and mobile device.

3. The movie can be played on your mobile device, as well as on your computer.

Cloudy With a Chance of Meatballs is available on Blu-ray Disc™ from Sony Pictures Home Entertainment

© Chardchanin/Shutterstock.com

Ethics

- Ethical Use of Resources and Information
  - Ethical Use of School or Company Resources
    - Code of Conduct
      - Policy that specifies allowable use of resources by students or employees
      - Students and employees should be familiar with what is considered acceptable
    - Code of Ethics
      - Policy, typically for an industry or organization, that specifies overall moral guidelines adopted by that industry or organization
    - Whistleblowers have some protection under the law

Ethics

- – Ethical Use of Employee and Customer Information
  - Businesses need to decide what is ethical use of employee and customer information
  - Most business schools are incorporating business ethics courses into the curriculum
- – Cheating and Falsifying Information
  - Cheating at all levels of school is rampant
    - – Includes texting answers during exams, storing notes on smartphones, etc.
    - – Can be reduced by academic honor codes

Ethics

- Résumé padding is considered unethical by most companies
  - Many companies will terminate employees who were hired based on falsified résumés or applications
  - Other possible consequences include blacklisting from a industry or being sued for breach of contract
- Also exists in IT certification tests
- For personal situations (online profiles, chat rooms, etc.) there are differing opinions about how ethical providing inaccurate information is

Ethics

- Computer Hoaxes and Digital Manipulation
  - Computer Hoax

    FIGURE 16-12
    Hoax-Slayer. This is one site that can be used to research possible computer hoaxes.

    - An inaccurate statement or story spread through the use of computers

    - Often sent via e-mail or social media

    - Often related to viruses, health issues, impending terrorist attacks, etc.

    - Consider researching before passing on to others

Ethics

- Digital Manipulation
  - Digitally altering text, images, photographs, music, and other digital content
  - Copyright concern
  - Can be used to misquote people, repeat comments out of context, or create false or misleading photographs
  - Some beneficial ethical uses (aging photos of runaways and missing children, altering photos of wanted criminals, etc.)
  - Use by media is controversial

Ethics

DIGITALLY ALTERED PHOTO

ORIGINAL PHOTO

Chris Pizzello/Invision/AP

FIGURE 16-13

Digital manipulation.
The digitally mani-
pulated photo (bottom)
added sleeves and
a higher neckline to
the real photo (top) of
Michelle Obama.

Ethics

- Ethical Business Practices and Decision Making
  - Fraudulent Reporting and Other Scandalous Activities
    - Sarbanes-Oxley Act of 2002
      - Includes provisions to improve the quality of financial reporting, independent audits, and accounting services for public companies
  - Ethically Questionable Business Decisions
    - Whether or not to implement a business process or decision that is ethically questionable
    - Customer privacy decisions
      - Plastic surgery photos posted online, etc.

Ethics

- – Ethically Questionable Products or Services
  - Decisions regarding selling products or services some individuals find objectionable
  - How, if at all, should businesses that allow users to upload content to their Web sites monitor the content posted
  - Age Verification
    - – Proof of age requirements for selling liquor, tobacco, and other adult products via Internet
    - – Online age- and identity-verification is an emerging option

Ethics

- Workplace Monitoring
  - Inform employees of the types of monitoring that may occur
  - Especially in countries other than the United States (the EU has limits on the types of monitoring that can be done without employee notification)
  - Social media scrutiny
    - Often done during hiring process
    - Requiring full access to social media is considered by many to cross the ethical line

Ethics

- – Cultural Considerations
  - Ethics vary within a country as well as from country to country
  - Some acts may be socially acceptable or ethical in one country but not another
  - Individuals and businesses need to consider both legal and ethical issues in global transactions
  - Some business schools and corporations are including diversity and cross-cultural training

FIGURE 16-15
Cultural considerations.
In some countries, bootleg copies of music CDs and movie DVDs are sold openly.

Imageinechina via AP Images

Quick Quiz

1. An inaccurate statement or story spread though the use of computers is referred to as _____.

   a. digital manipulation

   b. code of ethics

   c. computer hoax

2. True or False: Most legal experts agree that it's okay for someone who has legally obtained an audio CD to transfer those songs to a CD-R disc or portable media player for personal use.

3. A(n) _____ is an inaccurate statement or story spread through the use of computers.

Answers:

1) c; 2) True; 3) computer hoax

Computers and Health

- Physical Health
  - Computer use can cause physical injuries
    - Eyestrain
    - Blurred vision
    - Fatigue
    - Headaches
    - Wrist and finger pain
    - Repetitive stress injury (RSI)
    - Carpal tunnel syndrome (CTS) (keyboard use)
    - DeQuervain's tendonitis (associated with tiny keyboards)

Computers and Health

- Computer vision syndrome (CVS)
- Backaches
- iPad shoulder from looking down at tablets
- Gorilla arm from touch screens
  – Other physical concerns
    - Heat from laptops
    - Hearing loss from headphones
      – 60/60 rule
      – Noise reduction headphones
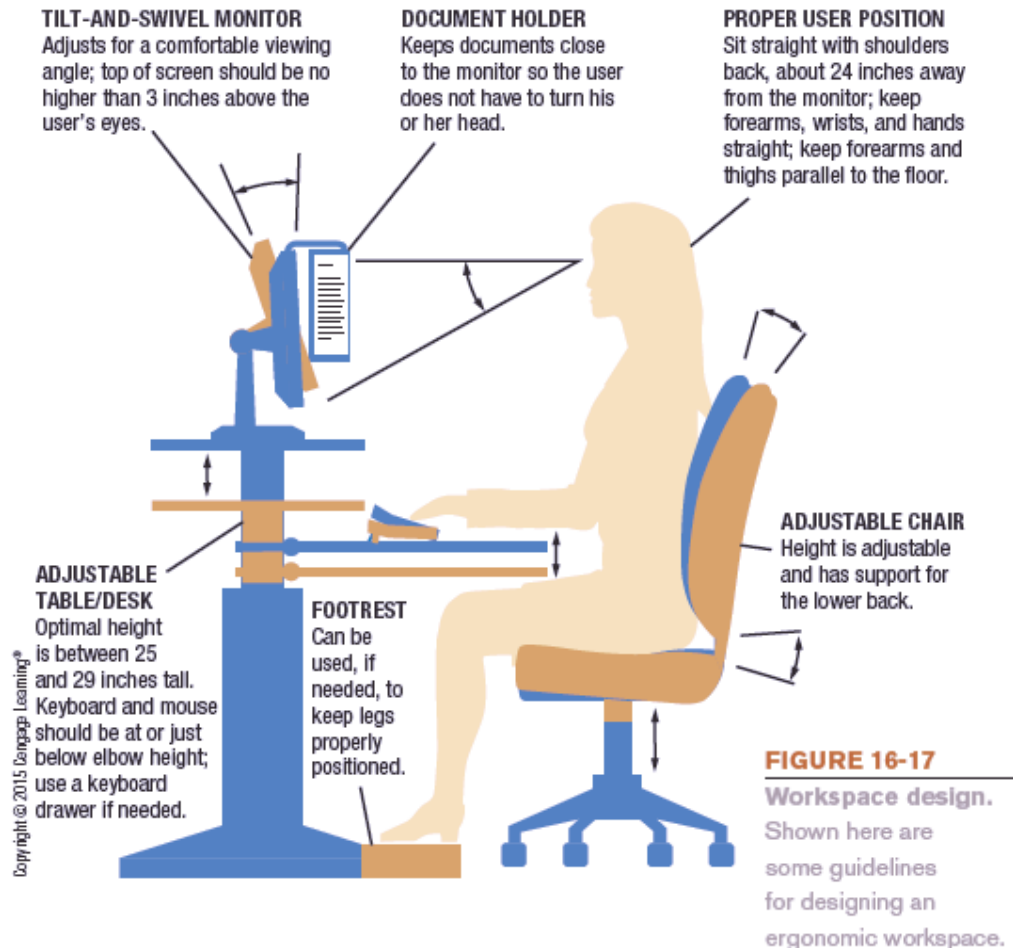
Computers and Health

- Texting or otherwise using phone while driving
  - Illegal in most states
  - Apps and other controls can be used to prevent use of phone while the car is in motion
- Possible radiation risks from wireless devices

FIGURE 16-16
Safe driving apps.
Restrict mobile phone use when the car is in motion.

Courtesy Cellcontrol™

Computers and Health

- What Is Ergonomics?
  - The science of fitting a work environment to the people who work there
- Workspace Design
  - The design of a safe and an effective computer workspace

TILT-AND-SWIVEL MONITOR
Adjusts for a comfortable viewing angle; top of screen should be no higher than 3 inches above the user's eyes.

DOCUMENT HOLDER
Keeps documents close to the monitor so the user does not have to turn his or her head.

PROPER USER POSITION
Sit straight with shoulders back, about 24 inches away from the monitor; keep forearms, wrists, and hands straight; keep forearms and thighs parallel to the floor.

ADJUSTABLE TABLE/DESK
Optimal height is between 25 and 29 inches tall. Keyboard and mouse should be at or just below elbow height; use a keyboard drawer if needed.

FOOTREST
Can be used, if needed, to keep legs properly positioned.

ADJUSTABLE CHAIR
Height is adjustable and has support for the lower back.

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FIGURE 16-17
Workspace design. Shown here are some guidelines for designing an ergonomic workspace.

Computers and Health

- More difficult with portable computers and mobile devices, but possible to improve work environment
- Travel mice and travel keyboards can help while on the go
- Standing desks are an emerging trend
- Docking station
  - Designed to connect a portable computer to peripheral devices more easily
- Notebook or tablet stand
  - Elevates a notebook/media tablet to the proper height
- Smartphone docks

Computers and Health

DOCKING STATIONS

Courtesy ASUSTeK Computer Inc.

TABLET STANDS

Courtesy Belkin International, Inc.

SMARTPHONE DOCKS

Courtesy Bluelounge

FIGURE 16-19
Docking stations and device stands can help create a more comfortable working environment.

Computers and Health

OCCASIONAL USERS	FULL-TIME USERS
Sit with the device on a table and position it for comfortable wrist posture, using a stand for tablets whenever possible. If no table or stand is available, use a laptop desk to protect your legs.	Sit with the device on a desk or table (use a notebook or tablet stand to attain the proper display screen height); use a separate keyboard and mouse.
Adjust the screen to a comfortable position so you can see the screen as straight on as possible. If you will be doing extensive touch screen work, tilt the device so it is not in a vertical position.	Elevate the device so the screen is at the proper height and distance, or connect the device to a stand-alone monitor; in either case, adjust the screen to the proper viewing angle and distance.
Bring a travel keyboard and mouse to use with the device, whenever practical.	Use a separate keyboard and mouse, either attached directly to the device or to a docking station or notebook stand.
When purchasing a new device, pay close attention to the total weight of the system if you will be using it primarily while traveling.	When purchasing a new device, pay close attention to the size and clarity of the display screen, as well as the ease of connecting the device to a docking station or stand and additional hardware.

FIGURE 16-20

Ergonomic tips for portable computer and media tablet users.

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Computers and Health

- Ergonomic Hardware
  - Can help avoid physical problems or alleviate discomfort of existing problems
  - Ergonomic keyboards
  - Trackballs
  - Tablet arms
  - Document holders
  - Antiglare screens
  - Keyboard drawers/trays
  - Computer gloves

Computers and Health

Courtesy Kinesis Corporation; Used with permission from Microsoft Corporation
Courtesy Ergotron, Inc.; Courtesy of Brown Medical Industries, Inc.

DESKTOP ERGONOMIC KEYBOARDS

MOBILE ERGONOMIC KEYBOARDS

ERGONOMIC MICE

TABLET ARMS

KEYBOARD DRAWERS/TRAYS

COMPUTER GLOVES

FIGURE 16-21
Ergonomic
hardware.

Computers and Health

– Good User Habits and Precautions

CONDITION	PREVENTION
Wrist/arm/ hand soreness and injury	➤ Use a light touch on a keyboard and touch screen. ➤ Rest and gently stretch your fingers and arms every 15 minutes or so. ➤ Keep your wrists and arms relaxed and parallel to the floor when using a keyboard. ➤ When using a touch screen for extended periods of time, place the device more horizontally than vertically. ➤ When using a device with a small keyboard, type short messages, take frequent breaks, and use a separate keyboard whenever possible. ➤ Use an ergonomic keyboard, ergonomic mouse, computer gloves, and other ergonomic devices if you begin to notice wrist or hand soreness.
Eyestrain	➤ Cover windows or adjust lighting to eliminate glare. ➤ Rest your eyes every 15 minutes or so by focusing on an object in the distance (at least 20 feet away) for one minute and then closing your eyes for an additional minute. ➤ Make sure your display's brightness and contrast settings are at an appropriate level and the display is placed at an appropriate distance from your eyes. ➤ Use a larger text size or lower screen resolution, if needed. You should be able to read your display screen from three times the distance at which you normally sit.
Sore or stiff neck	➤ Use good posture; never hunch over a keyboard or device. ➤ Place your display and any documents you need to refer to while using your device directly in front of you. ➤ Adjust your display to a comfortable viewing angle with the top of the screen no higher than 3 inches above your eyes. ➤ Use a headset if you spend a significant amount of time on the phone; never prop a phone between your face and shoulders.

FIGURE 16-22

Good user habits. These preventative measures can help avoid discomfort while working on a computer or mobile device.

Computers and Health

Backache; general fatigue	➤ Use good posture and adjust your chair to support your lower back; use an ergonomic chair, if needed. ➤ Use a footrest, if needed, to keep your feet flat on the floor. ➤ Walk around or stretch briefly at least once every hour. ➤ Alternate activities frequently. ➤ When traveling, bring lightweight devices and carry only the essentials with you.
Ringing in the ears; hearing loss	➤ Turn down the volume when using headphones (you should be able to hear other people's voices). ➤ Wear over-the-ear-headphones instead of earbuds. ➤ Limit the amount of time you use headphones or earbuds. ➤ Use external speakers instead of headphones when possible.
Leg discomfort or burns	➤ Use a laptop desk, cooling stand, or other barrier between a portable computer and your legs when using a computer on your lap.

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FIGURE 16-22

Good user habits. These preventative measures can help avoid discomfort while working on a computer or mobile device.

Computers and Health

- Emotional Health
  - Increased use of computers and mobile devices in the home and office has raised concerns about emotional health
    - Stress and corresponding health issues
  - Stress of Ever-Changing Technology
    - Knowledge of and ability to use technology is becoming a necessity in many jobs
    - Technology changes at a rapid pace
    - Workers must regularly learn new skills which can create stress for many individuals

Computers and Health

POLICE OFFICERS

RESTAURANT SERVERS

AIRLINE PASSENGERS

FIELD WORKERS

FIGURE 16-23
Ever-growing computer use. Many jobs and tasks that did not require computer use in the past require it today.

Understanding Computers: Today and Tomorrow, 15th Edition

Computers and Health

– Impact of our 24/7 Society

- Ability to be in touch constantly can be a source of great stress for some people

- "On call 24/7" and can never get away

- Hard to relax when on vacation and available 24/7

- Many employees are expected to be available while on vacation

- Concerns of using bright screens in bed

FIGURE 16-24
Our 24/7 society.
With smartphones, media tablets, and portable computers, many individuals are available 24/7.

Understanding Computers: Today and Tomorrow, 15th Edition

Computers and Health

– Information Overload

- Good searching techniques are essential

- Do not try to read everything written on a subject

- Effectively manage your e-mail

  – Use e-mail filters, flags, and other tools

  – Check messages and updates only periodically

  – Turn off phone notifications as well

Computers and Health
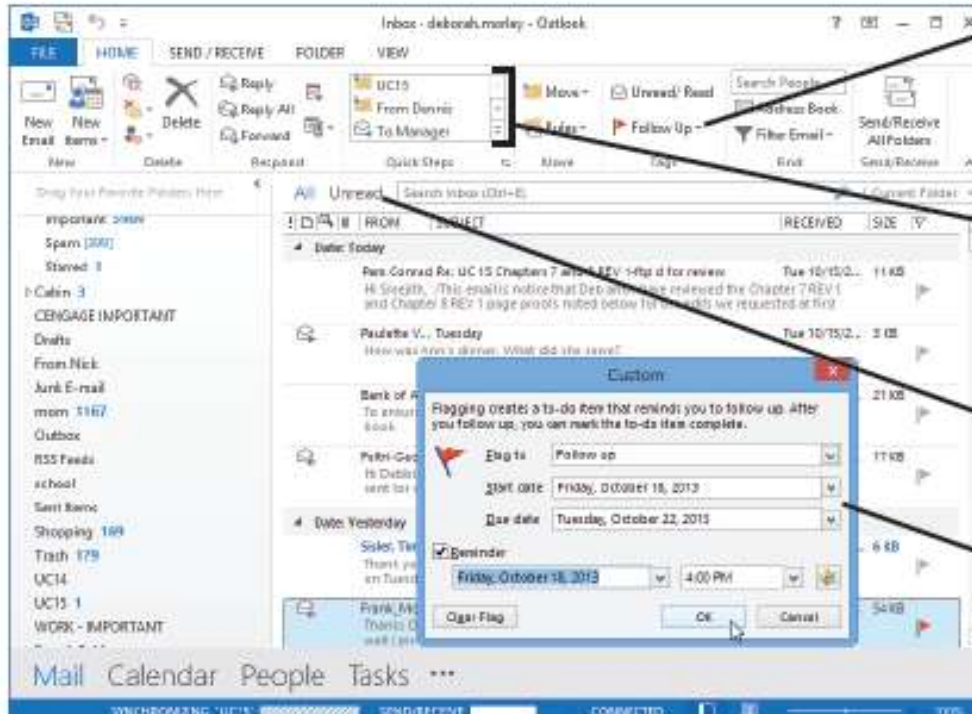
Click to flag an e-mail message.

Use these options to file a message into a Quick Steps folder or start an e-mail to a Quick Steps contact.

Click to view all unread messages.

Press Ctrl+Shift+G to open this dialog box in order to set a custom flag or reminder.

Used with permission from Microsoft Corporation

FIGURE 16-25
E-mail reminder flags can help you organize your Inbox.

Computers and Health

- Burnout
  - A state of fatigue or frustration brought on by overwork
  - Early Signs
    - Feelings of emotional and physical exhaustion
    - No longer caring about a project that was once exciting
    - Irritability or feelings of resentment about amount of work to be done
  - Suggested Solutions
    - Reevaluate schedule, priorities, and lifestyle
    - Take a break or get away for a day
    - Say no to additional commitments
    - Develop healthy food and exercise routines

Computers and Health

– Internet and Technology Addiction

- Problem of overusing, or being unable to stop using, the Internet
- Can affect anyone
- Can involve e-mailing, texting, online shopping, online gambling, social media, online gaming, cybersex, etc.
- May have significant consequences, such as relationship problems, job loss, academic failure
- Increasingly being tied to crime and even death
- Can be treated, similar to other addictions

Computers and Health

Courtesy of Dr. Kimberly Young, Director of the Center for Internet Addiction Recovery

Do you feel preoccupied with the Internet (think about the previous online activity or anticipate the next online session)?

Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?

Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?

Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?

Do you stay online longer than originally intended?

Have you jeopardized or risked the loss of a significant relationship, job, educational, or career opportunity because of the Internet?

Have you lied to family members, a therapist, or others to conceal the extent of involvement with the Internet?

Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?
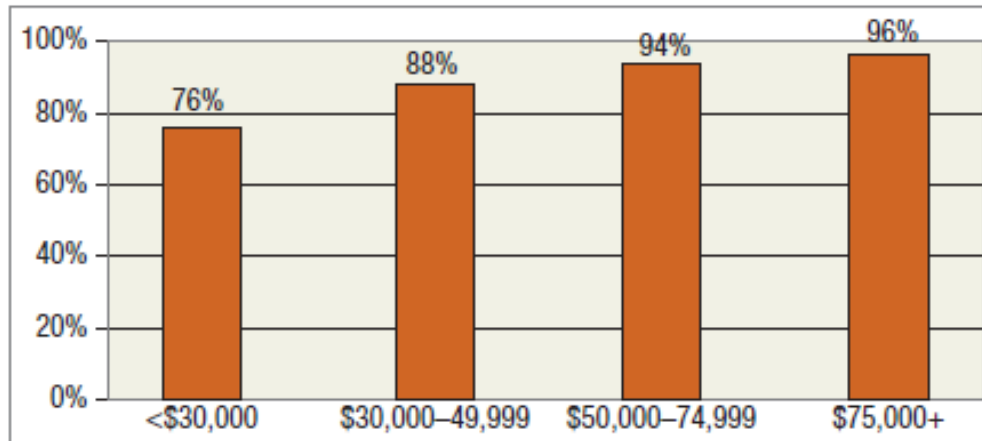
FIGURE 16-26

Signs of Internet addiction. You may be addicted to the Internet if you answer "yes" to at least five of these questions.
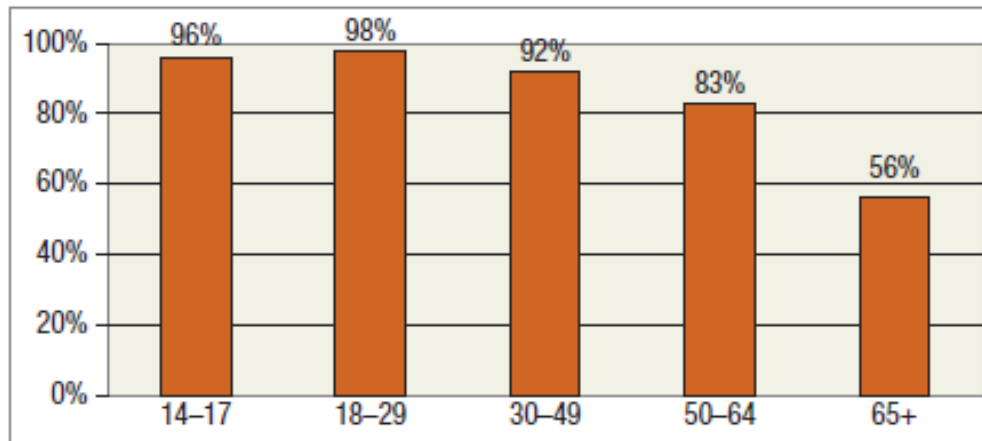
Access to Technology

- The Digital Divide
  - The gap between those who have access to technology and those who don't
  - Can have digital divide within a country, as well as between countries
  - U.S. Digital Divide
    - Shrinking, but individuals with a higher level of income or a higher level of education are still more likely to go online
    - Younger people using technology more
    - Some people choose not to use technology

Access to Technology

FIGURE 16-27

Key U.S. Internet use statistics. Shows the percent of individuals in each category who use the Internet.
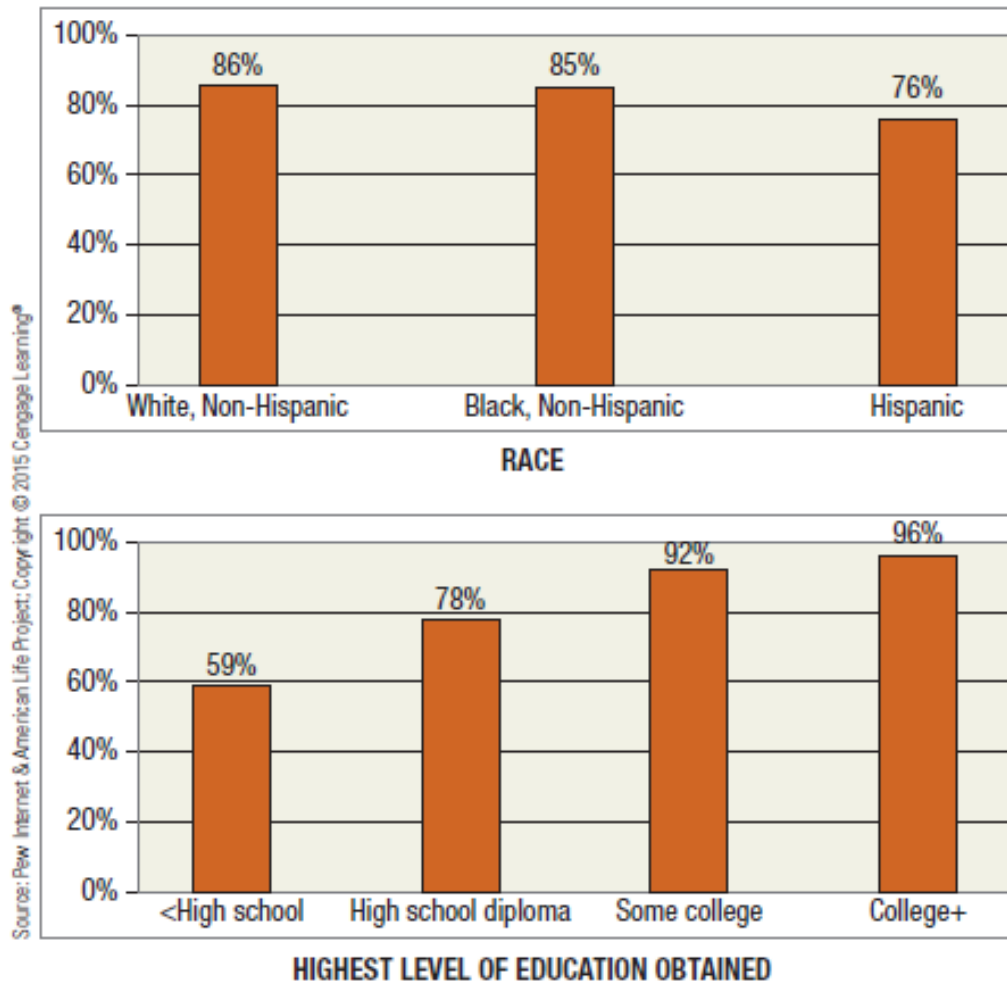
Access to Technology

FIGURE 16-27

Key U.S. Internet use statistics. Shows the percent of individuals in each category who use the Internet.

Access to Technology

- The Global Digital Divide
  - Some countries have access to technology and others do not have the same level of access
  - Perhaps more dramatic than the U.S. digital divide
    - More than 2.4 billion people world-wide are online (34% of the world's population)
    - 78% of the North American population is online
    - 15.6% of Africa's population is online
  - Technology can provide telemedicine and education to remote areas

Access to Technology

- New projects are emerging that may help to reduce the global digital divide
  - One Laptop Per Child (OLPC) project
    - Goal is to provide every child in the world with access to a personal connected laptop
    - XO laptop
    - XO tablet available to the general public

FIGURE 16-28
The OLPC XO laptop.

Courtesy One Laptop Per Child

Access to Technology

- Assistive Technology
  - Hardware and software designed for use by individuals with physical disabilities
  - Much improvement in assistive technology has occurred in recent years
    - Demand from disabled individuals and disability organizations
    - American with Disabilities Act
      - Requires companies with 15 or more employees to make reasonable accommodations for known physical or mental limitations of otherwise qualified individuals, unless doing so results in undue hardship for the company

Access to Technology

– Apps and devices to assist with day-to-day tasks

- AAC systems

– Assistive Input Systems

- Braille keyboards
- Keyguards
- One-handed keyboards
- Switches
- Foot-controlled mice
- Head pointing systems
- Eye tracking systems

FIGURE 16-30
AAC systems help individuals with speech disabilities communicate with others.

Access to Technology

BRAILLE KEYBOARDS
The keys on this keyboard contain Braille overlays.

Courtesy of Hooleon Corporation

ONE-HANDED KEYBOARDS
Each key on this half keyboard contains two letters (one set for the keys on the right half of the keyboard and one set for the left half) so all keys can be reached with one hand.

Courtesy of Matias Corporation

EYE TRACKING SYSTEMS
Cameras track the user's eye movements, which are used to select icons and other objects on the screen.

Courtesy Tobii Technology AB

FIGURE 16-31
Assistive input devices.

Access to Technology

- – Assistive Output Systems
  - Screen readers
  - Braille displays
  - Braille printers
  - Windows and Mac OS include a screen reader, on-screen keyboard, speech recognition capabilities, and settings that can magnify the screen, change text size and color, and convert audio cues into written text

Access to Technology

SCREEN READER SOFTWARE

BRAILLE DISPLAYS

BRAILLE PRINTERS

FIGURE 16-32
Assistive output devices.

Quick Quiz

1. Which of the following is NOT an assistive input device?

   a. Braille display

   b. Head-pointing system

   c. One-handed keyboard

2. True or False: Internet addiction affects only teenagers.

3. A device designed to connect a portable computer to conventional hardware such as a keyboard, mouse, and printer is called a(n) _____.

Answers:

1) a; 2) False; 3) docking station

Environmental Concerns

- Green Computing
  - The use of computers in an environmentally friendly manner
  - Energy and paper consumption are key concerns today
  - ENERGY STAR Program
    - Developed to encourage the development of energy-saving devices
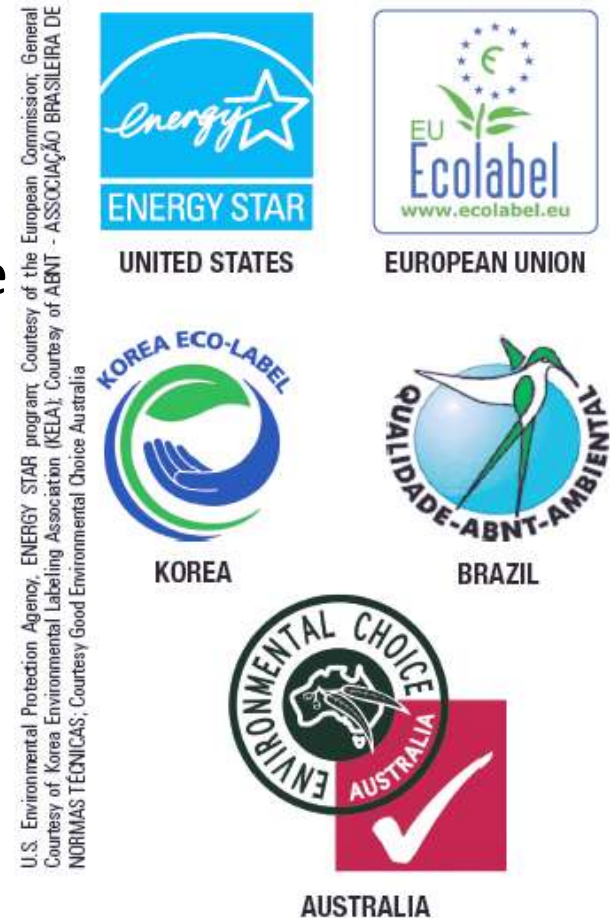   - Eco-labels also used in other countries

FIGURE 16-33
Eco-labels.

Environmental Concerns

– Energy Consumption and Conservation

- Power consumption and heat generation by computers are key concerns for businesses

  – More powerful computers use more energy and run hotter, increasing cooling costs

  – Servers are especially power-hungry

- Some energy-saving features

  – Low-power sleep mode when not in use

  – Energy- efficient flat-panel displays

  – Liquid cooling systems

  – CPUs that power up and down on demand

Environmental Concerns

– Solar power and other alternatives

- Solar panels convert sunlight into direct current (DC) electricity, which is then stored in a battery

- Available for a number of applications

  – Solar panels are built into the covers of some computer and tablet cases

  – Portable solar panels can be attached to backpacks and other items

- Hand-powered chargers can be used with portable computers, smartphones, and other mobile devices

Environmental Concerns

SOLAR COMPUTER AND TABLET BAGS

Courtesy Voltaic Systems, Inc.

SOLAR-POWERED CHARGERS

Courtesy Voltaic Systems, Inc.

HAND-POWERED CHARGERS

Courtesy of SOScharger.com

FIGURE 16-35
Alternate power.
Solar and hand power can be used to power smartphones, portable digital media players, GPS devices, portable computers, and other devices.

Environmental Concerns

– Green Components

- Computers run quieter and cooler
- More recyclable hardware and packaging being used
- Amount of toxic chemicals in personal computers being reduced
- Recycled plastics being used in some mobile phones
- Built-in solar panels can charge devices

Trend Box

Power To Go

- Portable power devices can power your portable computers and mobile devices

- PowerCup inverter

    - Runs off car's battery

- PowerTrekk charger

    - Uses fuel cell technology

    - Water and fuel pucks

Water and puck power the charger.

The charger powers your devices.

Courtesy myFC

Environmental Concerns

- Recycling and Disposal of Computing Equipment
  - Paper-based trash
    - Paperless office basically a myth
    - Almost one-half billion pieces of paper a year generated by printers worldwide
    - Utilities designed to reduce paper consumption
      - GreenPrint, PrintWhatYouLike.com
        » Eliminate images, blank pages, non-critical content in order to print on the least amount of paper as possible

Environmental Concerns

– E-waste (e-trash)

- Discarded computer components
- Current hardware contain a variety of toxic and hazardous materials
- Global concern is where it all eventually ends up

Copyright Basal Action Network [2013]

FIGURE 16-36

E-waste. E-waste is often exported to developing countries.

Environmental Concerns

- – Proper recycling is essential

    - • Some recycling centers will accept computer equipment

- – Many computer manufacturers have voluntary take-back programs

- – Expired toner and ink cartridges can sometimes be returned to manufacturer or exchanged when purchasing new cartridges

- – Using recharged printer cartridges saves consumers' money and helps reduce e-waste in landfills

Environmental Concerns

- – Can donate obsolete equipment to schools and other organizations
- – For security and privacy reasons, all data should be completely removed before disposal or donation

Courtesy Operation Homelink

FIGURE 16-37
Operation Homelink. The family of this soldier about to be deployed to Afghanistan will use this refurbished laptop to communicate with him while he is overseas.

Related Legislation

- There is legislation to protect intellectual property rights, such as:
  - Family Entertainment and Copyright Act of 2005
  - U.S. Anticybersquatting Consumer Protection Act of 1999
  - Digital Millennium Copyright Act (DMCA)
- Ethical legislation is more difficult to pass
  - The 1998 amendment to Section 508 of the Rehabilitation Act requires federal agency information be accessible to persons with disabilities

Related Legislation

- Currently, no federal computer recycling laws are in effect in the U.S.

  - Federal agencies are required to purchase energy-efficient electronic products

- The Sarbanes-Oxley Act and HIPAA established privacy and data protection standards

Quick Quiz

1. Which of the following is NOT a form of alternate power?
   - a. Solar power
   - b. Fuel cell technology
   - c. Eco-label

2. True or False: E-waste is no longer a concern today since modern computers contain very few toxic materials.

3. The _____ makes it illegal to circumvent antipiracy measures built into digital media and devices.

Answers:

1) c; 2) False; 3) Digital Millennium Copyright Act (DMCA)

Summary

- Intellectual Property Rights

- Ethics

- Computers and Health

- Access to Technology

- Environmental Concerns

- Related Legislation