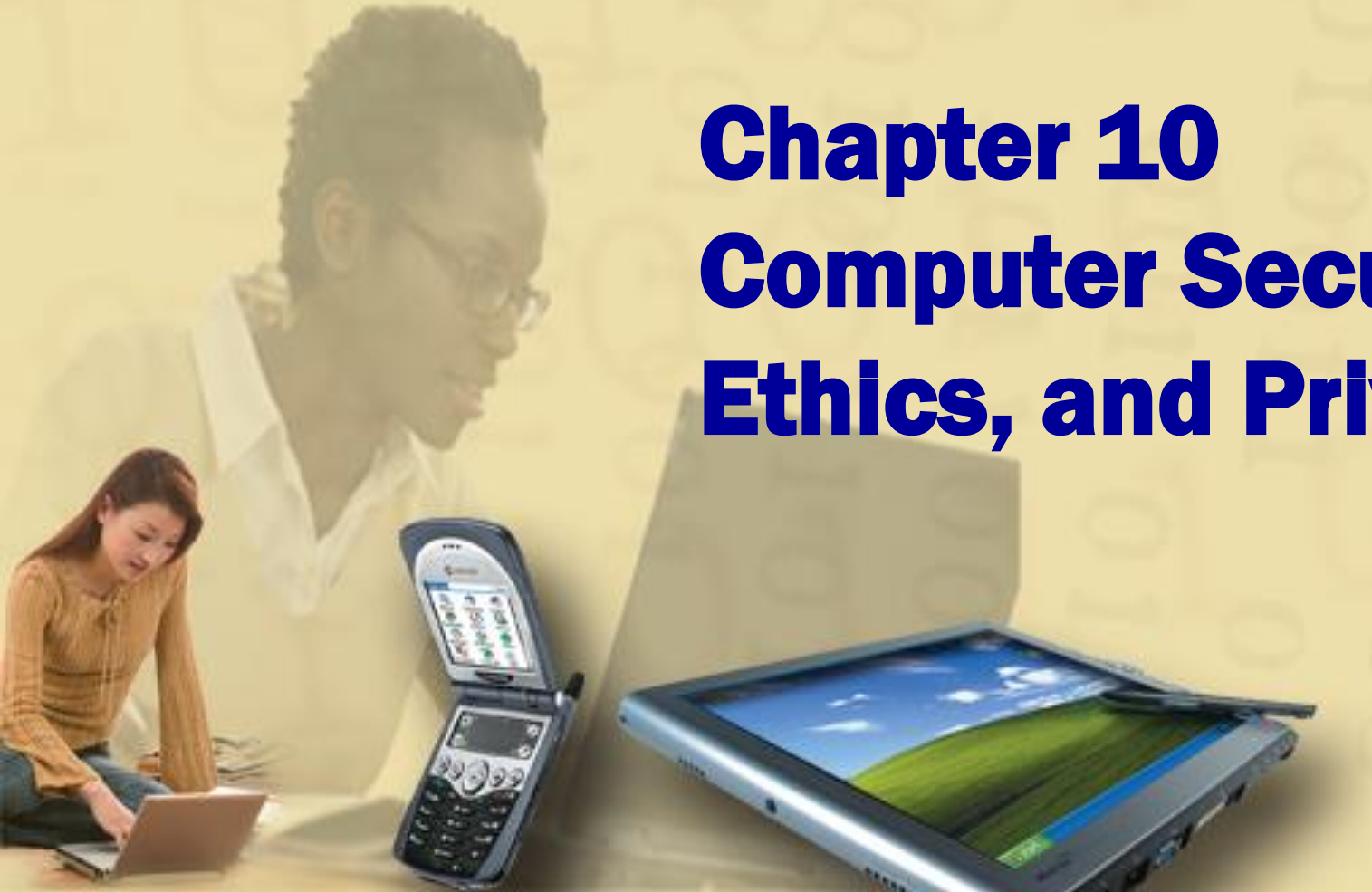
Discovering Computers

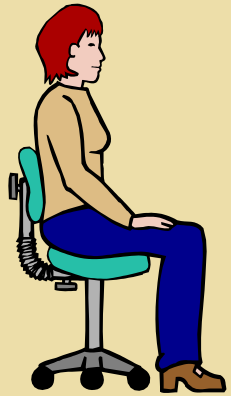
FUNDAMENTALS, Second Edition



Chapter 10
Computer Security, Ethics, and Privacy

Today

- **Security**
  - Internet and network attacks
  - Unauthorized use
  - Theft and vandalism
  - System failure
- **Ethics**
- **Privacy** Things will come to this
- **Health concerns**



Think about it...

What are some of the greatest Internet security risks you experience today?

Computer Security Risks

What is a computer security risk?

- **Action that causes loss of or damage to computer system**

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Next

FBI and cyber-crime

Cyber crime

Common internet frauds

Report on internet frauds

Internet and Network Attacks

What are viruses, worms, and Trojan horses?

Virus is a potentially damaging computer program

Can spread and damage files

Worm copies itself repeatedly, using up resources and possibly shutting down computer or network

Trojan horse hides within or looks like legitimate program until triggered

Does not replicate itself on other computers

Next

Warning Signs of Virus Infection

1. Your computer starts running sluggishly.
2. It shuts down unexpectedly or crashes frequently.
3. It experiences memory problems or runs out of disc space.
4. Unusual files or directories appear on your system.
5. Strange messages appear on your screen.

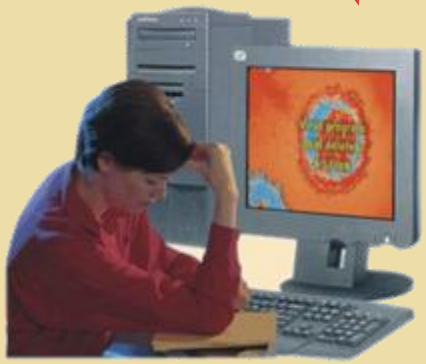
Internet and Network Attacks

How can a virus spread through an e-mail message?

Step 1. Unscrupulous programmers create a virus program. They hide the virus in a Word document and attach the Word document to an e-mail message.

Step 2. They use the Internet to send the e-mail message to thousands of users around the world.

Step 3a. Some users open the attachment and their computers become infected with the virus.



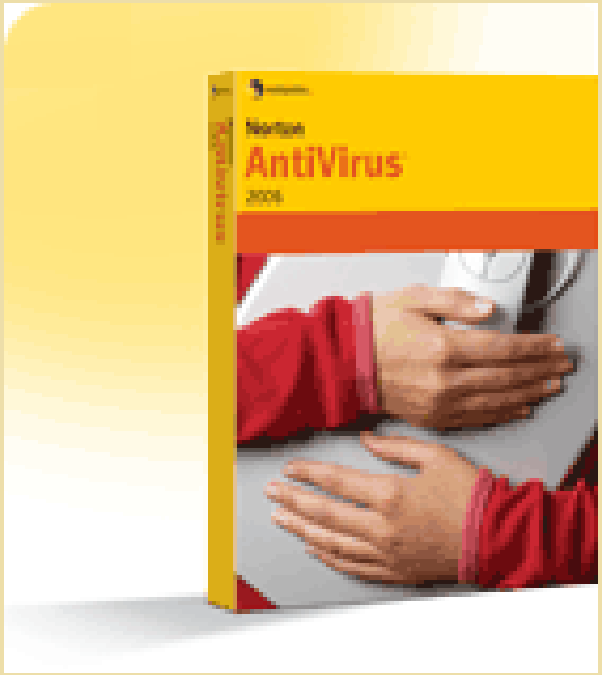
Step 3b. Other users do not recognize the name of the sender of the e-mail message. These users do not open the e-mail message. Instead they delete the e-mail message. These users' computers are not infected with the virus.

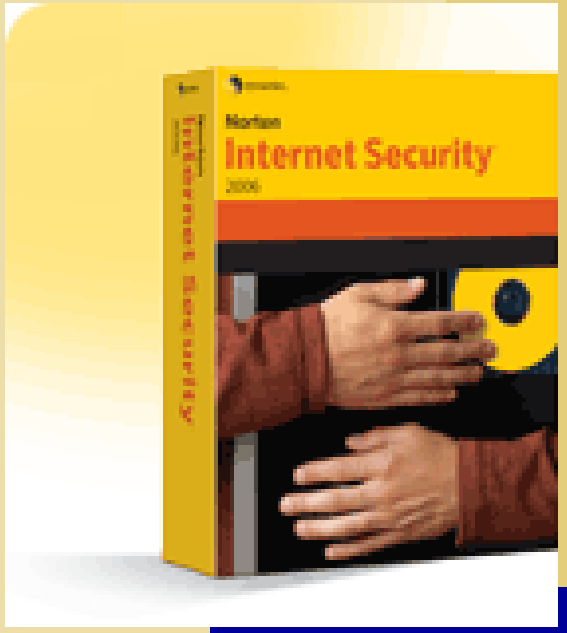
Next

Internet and Network Attacks

What is an antivirus program?

- **Identifies and removes computer viruses**
- **Most also protect against worms and Trojan horses**





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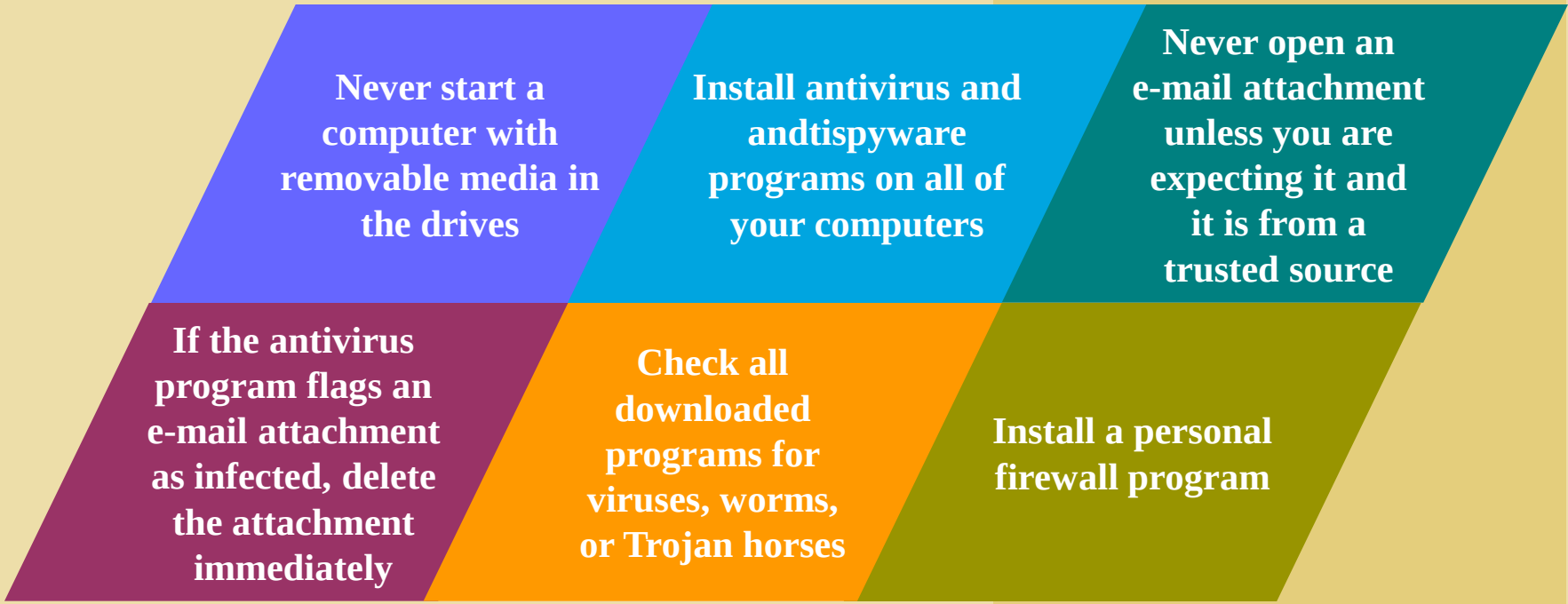
Internet and Network Attacks

What are some tips for preventing virus, worm, and Trojan horse infections?



Next

Internet and Network Attacks

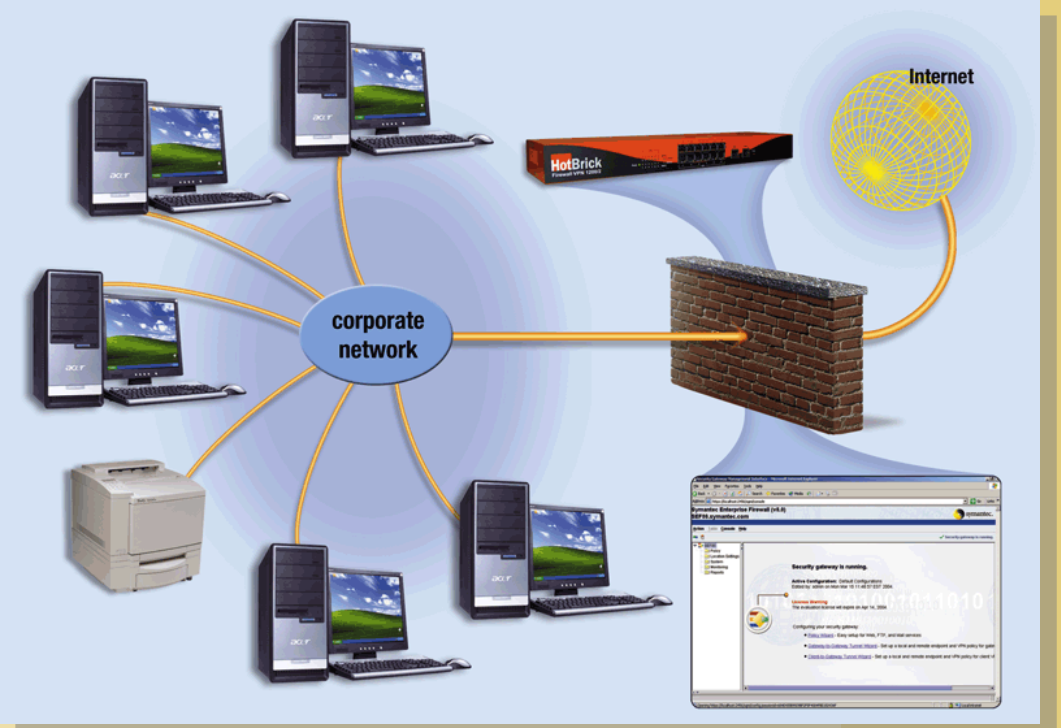
What happens if an antivirus program identifies an infected file?

Next

Internet and Network Attacks

What is a firewall?

- Security system consisting of hardware and/or software that prevents unauthorized network access



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Next

Virus creator vs. hacker

A 20-year-old Missouri hacker confessed that he had broken into the computer systems of two major corporations, collected passwords, and changed files. Prosecutors connected the hacker to the Internet Liberation Front, a group of hackers who oppose the commercialization of cyberspace.

- **What motivates hackers?**
- **Are they idealistic heroes, intellectual adventurers, malicious busybodies, or high-tech thieves?**
- **Are their motivations different from those who create computer viruses?**
- **What, if anything, should be done to deter hackers?**

Think about it...

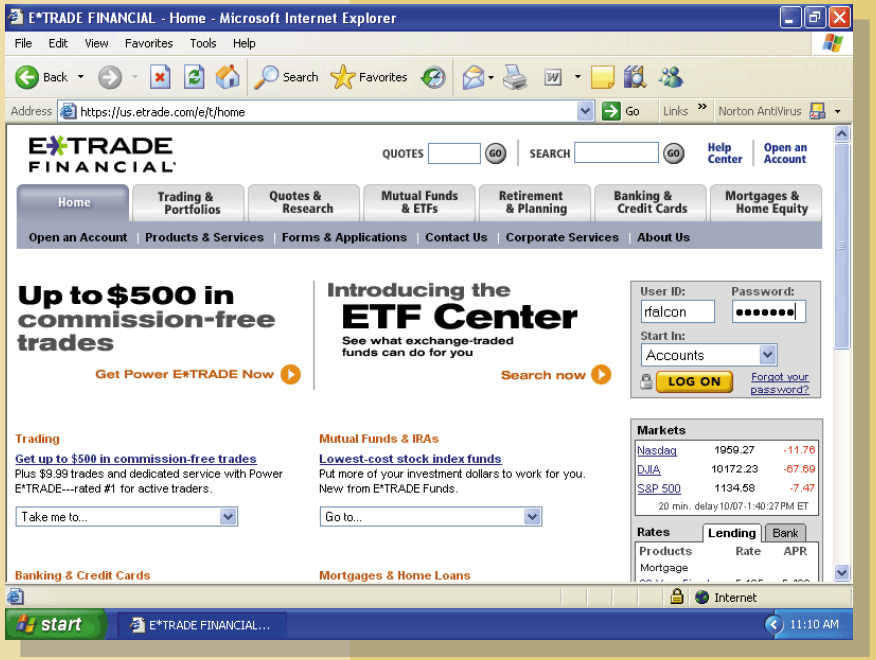
What are some ways that intruders can gain unauthorized access to your computer?

How does software prevent unauthorized access?

Unauthorized Access and Use

What is a user name?

- Unique combination of characters that identifies user
- Password is private combination of characters associated with the user name that allows access to computer resources



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Unauthorized Access and Use

How can you make your password more secure?

- Longer passwords provide greater security

PASSWORD PROTECTION		AVERAGE TIME TO DISCOVER	
Number of Characters	Possible Combinations	Human	Computer
1	36	3 minutes	.000018 second
2	1,300	2 hours	.00065 second
3	47,000	3 days	.02 second
4	1,700,000	3 months	1 second
5	60,000,000	10 years	30 seconds
10	3,700,000,000,000,000	580 million years	59 years

- *Possible characters include the letters A–Z and numbers 0–9*
- *Human discovery assumes 1 try every 10 seconds*
- *Computer discovery assumes 1 million tries per second*
- *Average time assumes the password would be discovered in approximately half the time it would take to try all possible combinations*

p. 369 Fig. 10-7

Next

Unauthorized Access and Use

What is a biometric device?

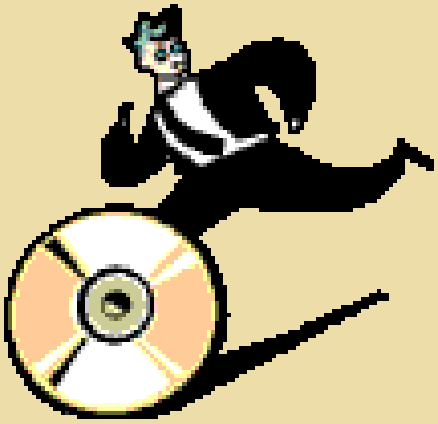
- **Authenticates person's identity using personal characteristic**
  - Fingerprint, hand geometry, voice, signature, and iris

p. 370 Fig. 10-8

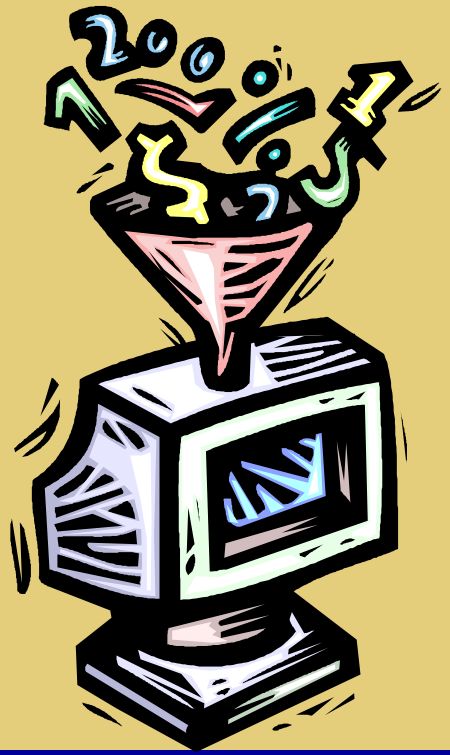
Next

Computer theft

- **Hardware theft**



- **Software theft**
  - Piracy

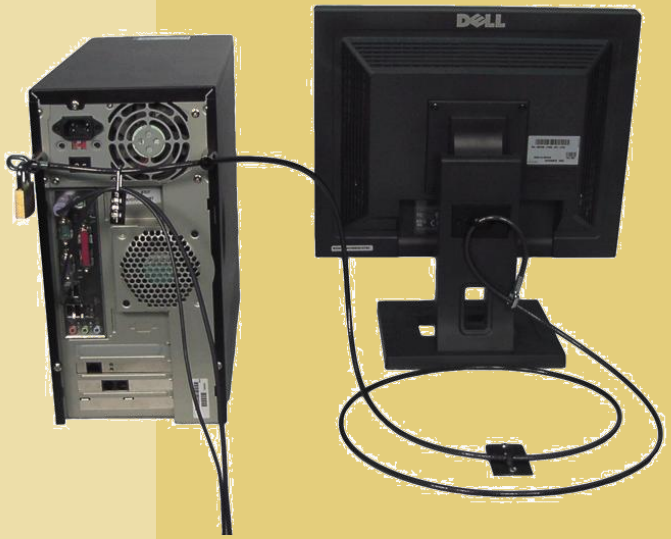


- **Data / information theft**

Hardware Theft and Vandalism

What are hardware theft and hardware vandalism?

- **Hardware theft is act of stealing computer equipment**
  - Cables sometimes used to lock equipment
  - Some notebook computers use passwords, possessed objects, and biometrics as security methods
  - For PDAs, you can password-protect the device
- **Hardware vandalism is act of defacing or destroying computer equipment**



p. 371 Fig. 10-9

Next

Software Theft

What is software theft?

Act of stealing or illegally copying software or intentionally erasing programs

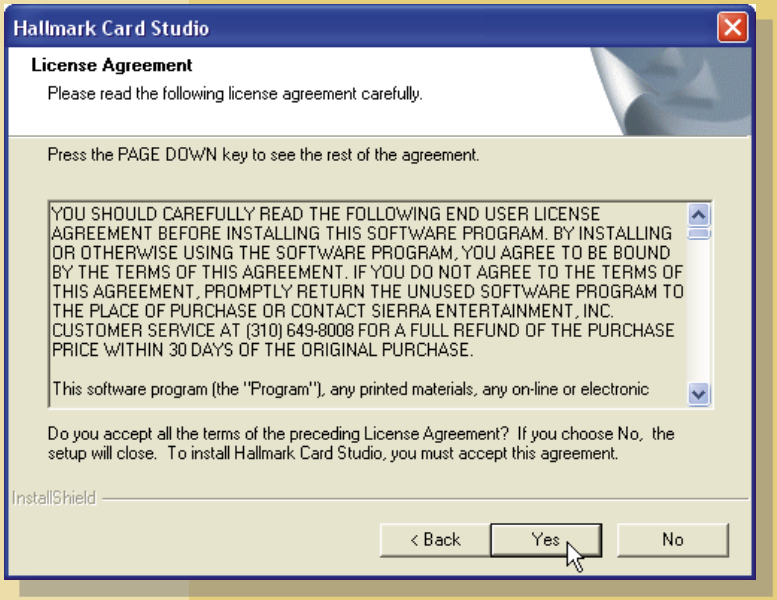
Software piracy is illegal duplication of copyrighted software

Next

Software Theft

What is a license agreement?

- Right to use software
- Single-user license agreement allows user to install software on one computer, make backup copy, and sell software after removing from computer



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Next

Software Theft

What is product activation?

Product activation allows user to input product identification number online or by phone and receive unique installation identification number

Next

Information Theft

What is encryption?

- Safeguards against information theft
- Process of converting plaintext (readable data) into ciphertext (unreadable characters)
- Encryption key (formula) often uses more than one method
- To read the data, the recipient must decrypt, or decipher, the data

SAMPLE ENCRYPTION METHODS

Name	Method	Plaintext	Ciphertext	Explanation
Transposition	Switch the order of characters	SOFTWARE	OSTFAWER	Adjacent characters swapped
Substitution	Replace characters with other characters	INFORMATION	WLDIMXQUWIL	Each letter replaced with another
Expansion	Insert characters between existing characters	USER	UYSYEYRY	Letter Y inserted after each character
Compaction	Remove characters and store elsewhere	ACTIVATION	ACIVTIN	Every third letter removed (T, A, O)

Click to view Web Link, click Chapter 10, Click Web Link from left navigation, then click Encryption below Chapter 10

p. 373 Fig. 10-11

Next

Backing Up — The Ultimate Safeguard

What is a backup?

Duplicate of file, program, or disk

- Full backup
  all files in
  computer
- Selective backup
  select which files
  to back up
- Three-generation
  backup
  preserves
  three copies of
  important files

In case of system failure or corrupted files,
restore files by copying to original location

Next

Ethics and Society

What are computer ethics?

Moral guidelines that govern use of computers and information systems

- **Unauthorized use of computers and networks**
- **Software theft**
- **Information accuracy**
- **Intellectual property rights—rights to which creators are entitled for their work**
- **Codes of conduct**
- **Information privacy**

Ethical or unethical?

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Information Privacy

What are some ways to safeguard personal information?

- Fill in only the necessary information on rebate, warranty, and registration forms
- Avoid shopping club and buyers cards
- Inform merchants that you do not want them to distribute your personal information
- Limit the amount of information you provide to Web sites; fill in only required information
- Install a cookie manager to filter cookies
- Clear your history file when you are finished browsing
- Set up a free e-mail account; use this e-mail address for merchant forms
- Turn off file and print sharing on your Internet connection
- Install a personal firewall
- Sign up for e-mail filtering through your Internet service provider or use an antispam program, such as Brightmail
- Do not reply to spam for any reason
- Surf the Web anonymously with a program such as Freedom Web Secure or through an anonymous Web site such as Anonymizer.com

Next

Information Privacy

What is a cookie?

Small file on your computer that contains data about you

User preferences

How regularly you visit Web sites

Interests and browsing habits

Some Web sites sell or trade information stored in your cookies

Set browser to accept cookies, prompt you to accept cookies, or disable cookies

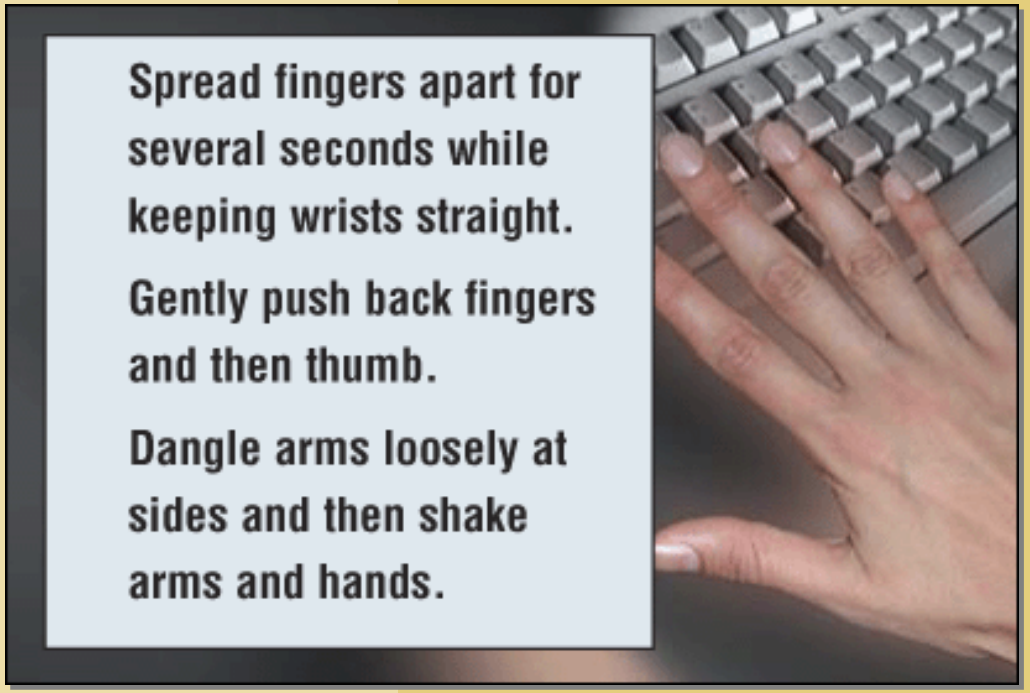
Click to view Web Link, click Chapter 10, Click Web Link from left navigation, then click Cookies below Chapter 10

Next

Health Concerns of Computer Use

What precautions can prevent tendonitis or carpal tunnel syndrome?

- **Take frequent breaks during computer session**
- **Use wrist rest**
- **Exercise hands and arms**
- **Minimize number of times you switch between mouse and keyboard**

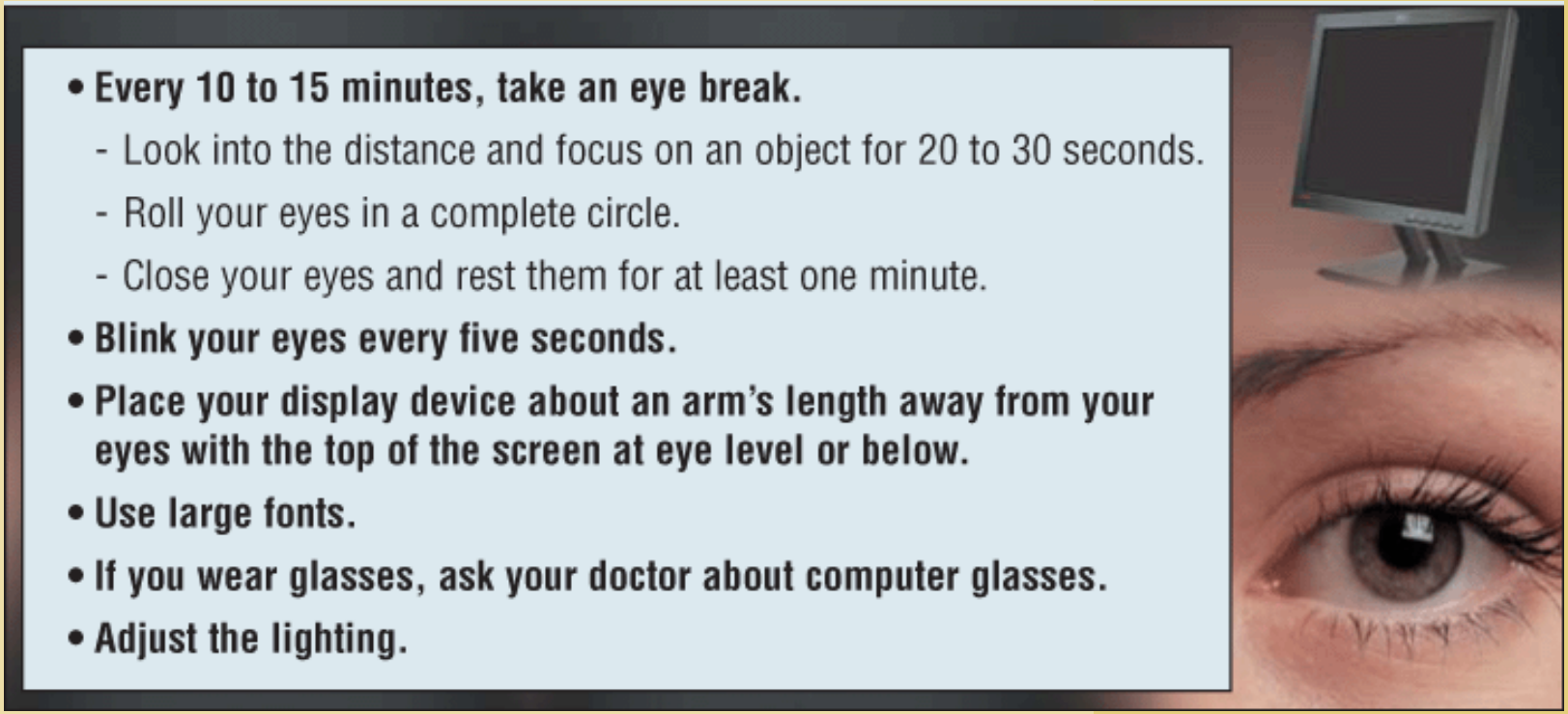


p. 385 Fig. 10-22

Next

Health Concerns of Computer Use

How can you ease eyestrain when working at the computer?



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Health Concerns of Computer Use

What is ergonomics?

- Applied science devoted to comfort, efficiency, and safety in workplace

p. 386 Fig. 10-24

Next

Think about it...

Which of the techniques in Figure 10-17 (p. 379) are you currently practicing? Which are you likely (or unlikely) to adopt? Why?