








Lesson 1

Introduction to Computer Security and Privacy

Lesson Contents

	What Is Computer Security and Privacy?
	Natural Threats
	Measures for Protection from Natural Threats
	Threats from Human Actions
	Measures for Protection Against Threats from Human Actions
	Computer Threats and Measures for Protection
	Self Test

Lesson Introduction

You store your important documents, such as your tax papers, securely so that they are not damaged or lost. You also ensure that no one has access to them without your permission.

If you use computers regularly, you may have a lot of information stored on the computer. This information may be in form of tax details, personal letters, or business correspondence. You need to ensure that this information is not viewed by other people without your permission. You also need to protect this information from getting damaged.

In this lesson, you will explore the need for protecting your computer hardware, software, and electronic data from damage, loss, and theft. You will also learn about the various solutions and devices that you can use to protect the data on your computer.



Lesson Objectives

After completing this lesson, you will be able to:

- Explain computer security and privacy.
- Identify natural threats to your computer.
- Identify measures to protect your computer against natural threats.
- Identify threats to your computer from human actions.
- Identify measures to protect your computer against threats from human actions.

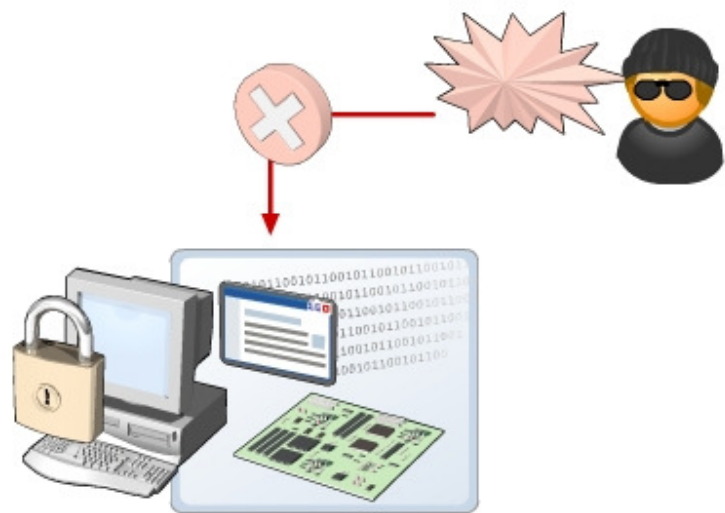
Topic: What Is Computer Security and Privacy?

Any factor that can damage your computer or the data on it is a computer threat. Natural events such as earthquakes or hurricanes can cause widespread physical damage. It is possible that you or someone else accidentally deletes some important files causing the computer to malfunction. When your computer is connected to a network, the computer becomes even more vulnerable to computer threats. For example, another user may use the network to gain unauthorized access to your computer.

There are various measures that you can use to reduce these threats and reduce the likelihood of loss due to damage. By following basic guidelines, you can minimize the risks of damage to your computer and ensure its security and privacy.

Computer Security

The computer hardware can be damaged due to human carelessness or natural causes. Also, the data and software on the computer need to be protected from accidental or intentional loss and tampering. Computer security deals with the measures that you can take to avoid such damage to the computer and its data.



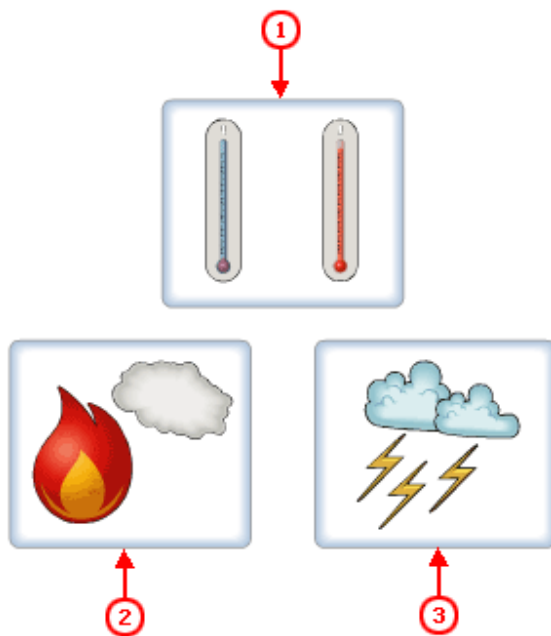
Computer Privacy

You store your personal files or documents on your computer and would not want anyone to read them. Computer privacy means that your data, such as personal files and e-mail messages, is not accessible by anyone without your permission. Computer privacy deals with the measures that you can take to restrict access to your data. Computer privacy also includes being careful while giving out any personal information over the Internet. Any such information is likely to be misused to gain access to your personal accounts, such as your e-mail and bank accounts.



Natural calamities such as earthquakes, floods, hurricanes, can damage your computer at any time. Natural calamities can cause fires, extreme temperatures, and lightning strikes that lead to major physical damage to the computers and loss of data.

This illustration describes the various natural threats to computer security and privacy.



1.	Most of the components of a computer are designed to operate within a specific temperature range. In case of excessive heat or cold, some components may start to malfunction, and you may need to replace them. If your computer has been exposed to extreme temperatures, let it return to room temperature before you start it.
2.	Fire can damage your computer beyond repair. Even if the computer does not directly catch fire, the heat caused is enough to melt the delicate components inside the computer. Moreover, smoke can damage the CPU fan, which in turn can cause overheating of the CPU and damage it.
3.	Lightning that strikes with a huge amount of electrical charge can cause a surge. A surge or spike is a sudden increase in the supply voltage, which can permanently damage some components of your computer. For example, a sudden increase in voltage can destroy the motherboard of your computer.

Topic: Measures for Protection from Natural Threats

Natural threats can cause considerable damage to your computer. The following table explains the measures that you can take to protect your data and computer from natural threats.

Measure	Description
Back up data	Backing up data involves creating multiple copies of your data. Events like floods and earthquakes can strike without warning. Making a backup helps you recover your data in case of any data loss. To provide better recoverability, keep a copy of your important data in a physically separate location, such as in another building or city.
Install computers in secure locations	Install your computer in a place where it is not likely to get damaged due to natural factors. For example, avoid installing computers in rooms that are exposed to excessive dust or moisture.
Install protective electrical devices	Install devices such as an Uninterruptible Power Supply (UPS) that can provide battery backup in case of a power outage. A UPS prevents software damage caused by abrupt shutting down of your computer. A UPS also provides surge protection and line-conditioning features, which help protect your computer against spikes and surges on the power line. You can also install separate surge protectors and line conditioners. However, in case of a strong surge, caused by events such as a major storm, you should turn off the computer and unplug it from the power to avoid damage.
Insulate computers from fire	Insulate the computers from fire by housing them in fire retardant surroundings. In addition, you can install adequate fire safety equipment and procedures for quick damage control.
Maintain appropriate temperature and humidity	You should maintain an optimum temperature and humidity level to ensure the smooth functioning of your computer. You can do this by installing devices such as air conditioners and humidity controllers.

Topic: Threats from Human Actions

A type of threat to your computer is malicious human sources. A discontented employee in your office can deliberately try to tamper with or destroy the data on your computer. A *hacker* is a person who tries to illegally access your computer when you connect it to the Internet. After accessing your computer, a hacker can steal or damage the data stored on the computer. In addition to malicious human threats, human errors such as accidental deletion of data and physical damage are also a threat to your computer. The following table describes various threats from malicious human sources and human errors to your computer.

Threat	Description
Theft	<p>Anyone can steal your computer or its components, if they have access to it. With the popularity of portable computers, such as laptops, physical theft of computers has become very common.</p> <p>You can also become a victim of virtual theft, when your computer is connected to the Internet. One example of virtual theft is <i>identity theft</i>, in which a hacker can steal your personal information to assume your identity. Using this false identity, the hacker can gain access to your finances or perform an illegal activity. Another example of virtual theft is <i>software piracy</i>, which is theft of a computer design or program. It can also mean unauthorized distribution and use of a computer program and confidential documents.</p>
Viruses, worms, and Trojan horses	<p><i>Viruses</i> are computer programs that can damage the data or software on your computer or steal the information stored on your computer. These viruses can reach your computer, without your knowledge, through the Internet or through storage devices, such as floppy disks and CD-ROMs. <i>Worms</i> are viruses that replicate themselves once they attack a computer, making it difficult to remove them. A <i>Trojan horse</i> is also a kind of virus disguised as useful software, such as a game or a utility. Once a Trojan horse reaches your computer, it starts acting like a virus causing damage to the computer's data.</p>
Spyware	<p><i>Spyware</i> are programs that get installed on your computer without your knowledge. They can secretly send out information about your Web browsing habits or other personal details to another computer through the network.</p>
Internet scams	<p>While using the Internet, you might come across some attractive offers through e-mail messages or chat room communication. You should be very careful before accepting any such offers because these offers can be part of well-planned scams that can cause you a financial loss.</p>
Online predators	<p><i>Online predators</i> are individuals who lure anybody online, into inappropriate and unethical relationships. You or your family members can become targets of online predators. Online predators develop contact with their targets by using e-mail or chat room communication.</p>

Accidental deletion of data	Many times, damage to a computer is due to unintentional human errors. Accidental deletion of an important file can disrupt the integrity of data or prevent other files or programs from working. For example, you may accidentally delete an important file, causing the computer to malfunction.
Accidental damage to hardware	Computer components, being delicate, run the risk of getting damaged due to carelessness. For example, if you accidentally drop your laptop computer, this might result in damage to the hardware components, such as motherboard or CD-ROM. As a result you lose the data stored on the computer. In addition, physical damage to data due to spilling of food and beverages on storage devices or peripherals can affect your computer.

Topic: Measures for Protection Against Threats from Human Actions

You can take some simple measures to minimize the risks associated with malicious human threats and human errors. The following table describes measures to protect your computer from malicious human sources and human errors.

Solution	Description
Store data safely	Keep your data in safe and secure locations that have limited access to others. This minimizes the possibility of theft or tampering of the data.
Encrypt data	The BitLocker feature of Windows Vista helps you encrypt data at the drive-level. When you encrypt data by using this feature, unauthorized users cannot access the data by removing the hard drive and attaching it to another computer.
Install antivirus and antispyware programs	<p>Antivirus and antispyware software programs have the ability to check for viruses and spyware present in the computer's memory and also prevent new ones from entering. You must regularly update antivirus and antispyware software so that they are able to recognize new viruses and spyware. Most antivirus and antispyware software offer the automatic updates feature that automatically installs the updated version of the software on your computer.</p> <p>Built-in features in e-mail software, such as Windows Mail, allow you to block junk e-mail messages and provide features to check for viruses and worms. Windows Vista includes Windows Defender, a built-in antispyware program, which provides real-time protection.</p>
Install firewall	Installing a firewall is another effective step that you can take to protect against malicious threats. A <i>firewall</i> enables you to filter the Internet traffic before it reaches your computer or a private network. It provides additional protection against threats such as hackers and viruses. A firewall also helps to ensure computer privacy by restricting external access to your computer by any unauthorized user. Windows Firewall that is available with Windows Vista blocks unwanted access to your computer.
Back up data	Regularly back up important computer data. Creating multiple copies of data provides protection against loss of data due to accidental erasure or destruction of data.
Keep computer in safe environment	<p>Keep the computer in an area that is dust-free, free from vibration, and out of the way of possible impact. The table or shelf housing the computer should be steady and stable to keep the computer from falling, even if the computer is bumped.</p> <p>Keep the computer away from any magnetic substance, water, or static discharge. For example, do not put the computer on the floor or on a rug. Avoid eating and drinking near the keyboard and use a keyboard cover to protect against any spillage.</p>

Topic: Computer Threats and Measures for Protection

Sort the measures for protection against various types of threats into their associated categories by writing the statement number in its corresponding option box.

Statement	
1	Surge protection and line conditioning
2	Data encryption
3	Insulation
4	Stable shelf
5	Sufficient distance from magnetic substances
6	Antivirus
7	Air conditioners and humidity controllers
8	Spyware protection
9	Keyboard cover
10	Firewall

Option 1	Option 2	Option 3
Natural Threats	Malicious Human Threats	Human Errors

Note: The correct answers are shown on the next page.

Option 1		Option 2		Option 3
Natural Threats		Malicious Human Threats		Human Errors
7, 3, 1		10, 8, 6, 2		9, 5, 4

Question 1

Which one of the following statements best describes computer privacy?

Select the one best answer.

<input type="checkbox"/>	Securing a computer from fires and earthquakes.
<input type="checkbox"/>	Protecting a computer from a power surge.
<input type="checkbox"/>	Preventing your friend from viewing your computer data without your permission.
<input type="checkbox"/>	Preventing important computer files from getting accidentally deleted.

Question 2

Which of the following security measures can you adopt to help protect your computer and its data against natural threats?

Select all answers that apply.

<input type="checkbox"/>	Surge protection.
<input type="checkbox"/>	Antivirus software.
<input type="checkbox"/>	Firewall.
<input type="checkbox"/>	Humidity control.

Note: The correct answers are shown on the next page.

Answer 1

Which one of the following statements best describes computer privacy?

Select the one best answer.

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> | Securing a computer from fires and earthquakes. |
| <input type="checkbox"/> | Protecting a computer from a power surge. |
| <input checked="" type="checkbox"/> | Preventing your friend from viewing your computer data without your permission. |
| <input type="checkbox"/> | Preventing important computer files from getting accidentally deleted. |

Answer 2

Which of the following security measures can you adopt to help protect your computer and its data against natural threats?

Select all answers that apply.

- | | |
|-------------------------------------|---------------------|
| <input checked="" type="checkbox"/> | Surge protection. |
| <input type="checkbox"/> | Antivirus software. |
| <input type="checkbox"/> | Firewall. |
| <input checked="" type="checkbox"/> | Humidity control. |