INFORMATION AND COMPUTER SECURITY

UNIT OUTCOME

Students will be able to:

- understand and aware of copyright issues;
- recognize national and international laws on copyright.

3.1 INFORMATION AND COMPUTER SECURITY

In Grade 9, you have studied some of the basic concepts of information and computer security. You know that computer viruses can corrupt and damage the computers. Viruses can also open security breaches on a computer that allows yet another threat, hackers, into computer system. Do you know that simply by the fact of having our school or home computers connected to a network and on the Internet (see Fig. 3.1); these are exposed to several information and computer security risks?
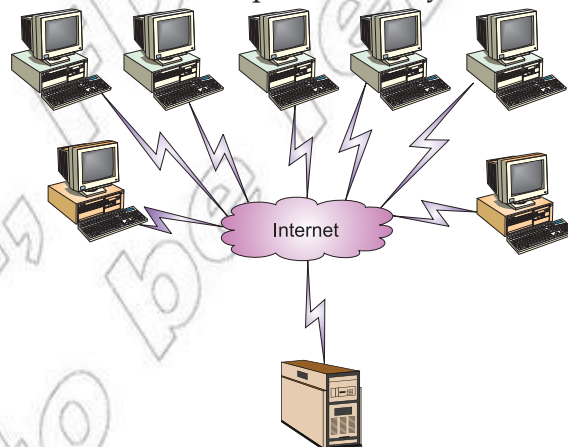

Internet

Fig. 3.1: Networking of computers exposes information and computer security

Information and computer security risks arise from the intentional or unintentional misuse of computers, network resources as well as the Internet. These risks may result in the loss of or damage to computer hardware, software, confidential information, and data integrity as well as network and Internet availability.

Hackers can do a number of things, from stealing your passwords to controlling your computer through remote access. So, every student and other computer users must know about information and computer security. Remember that violation of information and computer security is punishable.

All of us must make sure that we are aware of the security risks and develop the ability to know what to do in different situations. Figure 3.2 shows the impact of information and computer security on society.
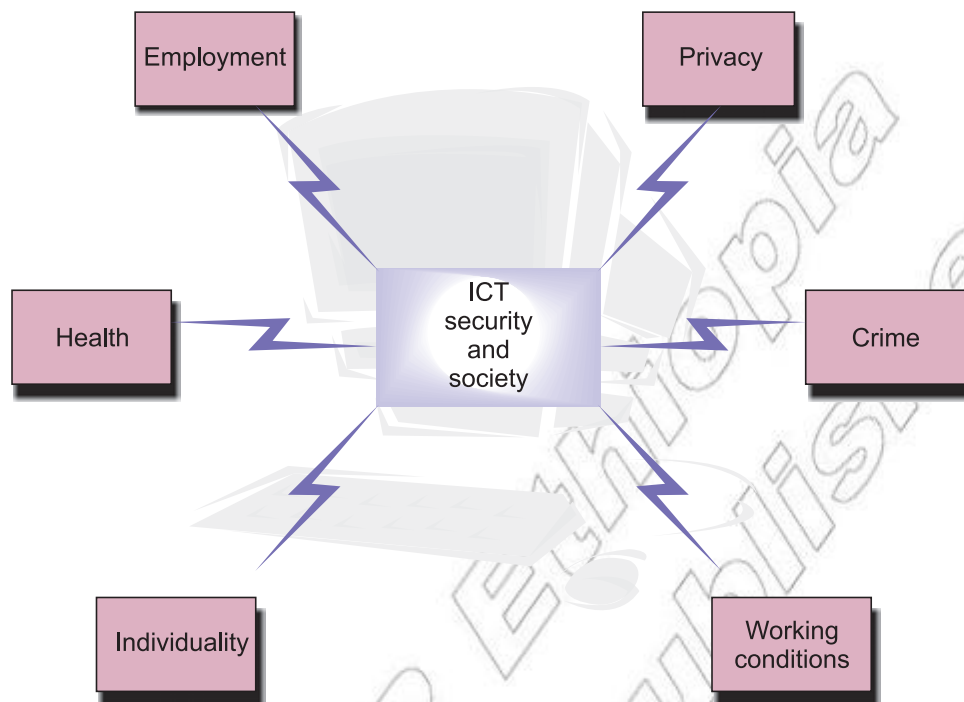

Fig. 3.2: Impact of information and computer security on society

In this unit, we will learn about information and computer security.

● Software Copyright

What is copyright?

Copyright is the exclusive legal right that prohibits the copying of intellectual property without the permission of the copyright holder. Figure 3.3 shows the copyright symbol.

Copyright relates to ownership of an original work. An original work can be in various forms: text, image, audio recording, video recording, computer software, website, etc. Copyright automatically belongs to the author(s) or creator(s)— but it may also be assigned to a third party, for example, a publishing house. The copyright owner(s) has/have the exclusive rights to prevent any third party from doing any of the following without permission:

Fig. 3.3: Copyright symbol

1. **Copy the work:** It includes photocopying (*e.g.*, copying a book), scanning of texts or images and reproducing them in electronic format, and duplicating audio and video recordings.

2. **Communicate copies of the work to the public:** It includes making a copy available on a public website and the intranet.

3. **Perform a drama or play, a piece of music or a song before the public:** It includes making recordings of such performances and uploading them to a public website and the intranet.

Fig. 3.4: Copying a book is violation of copyright

4. **Make derivative works:** It includes making modifications, adaptations or other new uses of a work, or translating the work to another media.

Remember that unless a work is clearly stated to be copyright-free or out of copyright by virtue of its age, it is illegal to download, scan or otherwise copy it for onward dissemination, even if no financial gain is there.

Software Copyright

Computer software is considered a literary work, *i.e.*, books, computer programs, e-mails, and databases etc. It is protected by copyright laws. Unauthorized copying of computer software is not allowed. This applies regardless of whether the original copies of the software have been purchased on a medium such as a CD-ROM or DVD (see Fig. 3.5), or downloaded from the Web.

Neither the networking of software without the proper permission from the copyright holder is allowed, nor is the copying of software onto several

Fig. 3.5: Computer software is available on DVDs

stand-alone computers. If the software is to be networked for simultaneous access by a number of users, proper permission has to be taken from the publisher. The software user must check the terms and conditions on the packaging of the software or in accompanying documentation—which may be in printed or electronic format.

Software can easily be copied, so it is very important that an educational institution possesses only legitimate copies of all the software it uses.

To summarize, it is illegal for the software users to do the following:

1. Lend software so that a copy can be made or to copy software while it is on loan.
2. Run a software program on two or more computers simultaneously unless the agreement permits it.
3. Copy or distribute the software or accompanying documentation without a licence or permission from the copyright owner.
4. Compel, allow, encourage or request that students/employees make, use or distribute illegal copies of software.

Copyright Issues for Software Developers

Software developers must ensure that they have a written agreement with the software users. In other words they must protect their software using copyright (see Fig. 3.6).

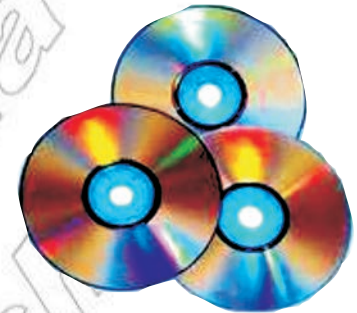**Fig. 3.6: Software developers must copyright their software**

The written agreement protects them with the copyright issues. Some important issues are:
1. An adequate description of the software and associated documentation.
2. Usage terms and conditions.
3. The right for the user to copy the software and/or associated documentation.
4. Permission to modify or alter the software.
5. The requirement that the user reports to the developer any infringement of copyright.
6. Sub-licences.
7. Maintenance/Warranty.

Dangers of Copying Others' Work

Plagiarism is copying others' work and presenting it as your own. Some dangers of copying others' work are:
1. It does not show that you understand the topic you have presented.
2. It just shows you can cut and paste.
3. It makes the software ineligible for free maintenance updates in some cases.
4. There is always the risk of installing malicious code on your computer.
5. It affects the rights of others.
6. It affects the social and economical development of all countries.

note You must recognize that the use of others' property is not proper.

• National and International Laws on Copyright

Copyright law aims to prevent people from taking credit for and profiting from other peoples' work. Ethiopia is not short of laws against copyright infringement. Software copyright law is something that affects anyone who uses a computer. It is not uncommon for a person or business to face civil or even criminal proceedings for software copyright infringement. At present, it is a complex area of law that is not widely understood in some countries. Ethiopia has not signed up the **Berne Convention** yet. However, the creative works may be copyright protected locally and directly in the Intellectual Property Department.

National Laws

In Ethiopia, copyright is a critical issue which requires serious attention and collective responsibility. The problem is now very big and forces the artists, the government and the society to realize its impacts and find its solutions. Ethiopia has enacted laws for the protection of literary works through copyright. The copyright law provides protection for the following:
1. Written works
2. Phonographs and cinematographic films
3. Theatre and musical pieces
4. Television and radio works for publication
5. Paintings
6. Sculpture and architecture
7. Maps
8. Speeches and
9. Literary work

The Copyright and Related Rights Proclamation considers software as a literary work and as such a fifty years protection is provided. The author has the right to commercially utilize his/her work within the bounds prescribed by law. Again, he/she has the right to maintain his/her copyrighted works by means of infringement actions to stop others from encroachment in his/her rights. He/she may take a criminal action or a civil action in case of any infringement.

In Ethiopia the revised criminal code prescribes five-year prison terms to those who violate the copyright law with negligence. A more severe penalty, a prison term of up to 10 years is prescribed against a violator if the act is intentional. In addition to this, a fine of 100,000 Birr as moral damage may also be levied on the guilty party.

There have been efforts made recently to try and tackle the problem of copyright violations. One such effort is the establishment of the Ethiopian Copyright and Related Rights Collective Management Society (ECRRCMS), which was officially established in November 2009, with Ekubay as its Chief Executive Officer (CEO).

International Laws

While there is no single international copyright law, many countries have agreed to international rules for protecting intellectual property from copyright infringement, piracy and counterfeiting.

Some international laws are given below:

1. **Berne Convention for the Protection of Literary and Artistic Works:** The Berne Convention requires its signatories to recognize the copyright of works of authors from other signatory countries (known as members of the Berne Union) in the same way as it recognizes the copyright of its own nationals. For example, French copyright law applies to anything published or performed in France, regardless of where it was originally created.

2. **EU Copyright and Neighbouring Rights:** Copyright and related rights provide an incentive for the creation and investment in new works and other protected matter (music, films, print media, software, performances, broadcasts, etc.) and their exploitation. This is contributing to improved competitiveness, employment and innovation. The field of copyright is associated with important cultural, social and technological aspects, all of which have to be taken into account in making a policy in this field.

3. **International Copyright Law:** Creators and users of copyrighted works should be aware of the differences in intellectual property law between nations. Many works are now distributed internationally or use components from authors in other nations. No international copyright law exists that will protect a work in every country of the world. However, several key international treaties that the US has signed protect works from and within member nations.

4. **WIPO Copyright Treaty:** The World Intellectual Property Organization (WIPO) Copyright Treaty is an international treaty on copyright law adopted by the member states of WIPO in 1996. It provides additional protections for copyright which are necessary due to advances in ICT since the formation of previous copyright treaties before it. There have been a variety of criticisms of this treaty, including that it is overbroad and that it applies a 'one size fits all' standard to all signatory countries despite widely differing stages of economic development and knowledge industry.

> **note** Ethiopia has yet to sign the Berne Convention for Literary and Artistic Works and the World Intellectual Property Organization (WIPO) Copyright Treaty.

● **Protection**

In Grade 9, you have studied that virus scanners are one of the most important tools to help protect your computer, for example Norton or McAfee. A firewall helps to block unwanted incoming connections to your computer from the Internet. Windows already has a built-in firewall. However, if you feel the need to increase your security, you can download a firewall program such as Zone Alarm, or Online Armor Free. It is also important to install new Windows updates as they appear on your computer. Often, Windows updates will address security issues found in the operating system.

Let us first discuss some important concepts, such as misuse of e-mail and unauthorized intrusion:

Misuse of E-mail

Every person or business that uses e-mail as the main communication tool should put together an e-mail etiquette guide. Many of us often forget that there is another person on the other end of an e-mail and this leads to misuse. Some people may not even be aware of the fact that they are misusing e-mail. For example, some people do not sign their name at the end of a message in the e-mail.

Fig. 3.7: Misuse of E-mail is growing

Some of the common mistakes people often make when using e-mail are:

1. Asking for receipts of all messages.
2. Not adding additional information to the messages you forward.
3. Typing a message in bold, capital letters. This is like shouting when talking to someone in person.
4. Sending lengthy e-mails. Remember that some things are better discussed over the phone or in person.
5. Overuse of the Carbon Copy feature.
6. This leads to the Blind Carbon Copy feature. It is rude to send an e-mail to one person and bcc another without their knowledge.
7. No inclusion of the appropriate greetings, etc.

These are just a few of the common e-mail misuses and there are many more. So, next time when you communicate via an e-mail, think before you send and make sure you are not guilty of these common e-mail misuses.

Unauthorized Intrusion

One type of information and computer security risk is unauthorized access and use. Unauthorized intrusion is the use of a computer or network without permission. Hackers typically break into a computer by connecting to it and then logging in as a legitimate user. Some intruders do no damage but they merely access data, valuable information or programs on the computer.

Unauthorized intrusion is the use of a computer or its data for unapproved or illegal activities. It includes a variety of activities such as gaining access to a bank computer and performing an unauthorized money transfer for financial gains, etc.

Sixth Annual IT Security Survey Report says that incidences of unauthorized intrusions of large companies increased significantly in 2010.

Some examples of unauthorized intrusion are:
1. Illegally accessing another person's data or private system files.
2. Corrupting, destroying, manipulating or deleting others' data with malicious intent.

3. Creating, storing, sending or viewing pornographic material.

4. Downloading, uploading and/or executing viruses, malware, scripts.

5. Using e-mail user IDs other than yours own ID.

6. Violating safety and/or security measures when using e-mail, chat rooms and other forms of direct electronic communications.

7. Hacking or any other unlawful online activities.

8. Providing unauthorized persons with passwords and access to computers or networks.

For preventing unauthorized intrusion:

1. Have a written acceptable user policy that specifies the computer activities for which the computer and the network may and may not be used.

2. Use firewall

3. Access controls

4. Use intrusion detection software

Now let us focus on protection:

Use of Internet technology often leads to violation of copyright laws. Remember that you own everything you create, regardless of whether you have filed it with the Copyright Office or not. To protect your material from unlawful distribution, make others aware of the terms of use of your intellectual property.

For protecting your materials do the following:

1. Include a prominently displayed statement of ownership with the material that you have posted on a Website or posted to someone else (for example, "This image is property of Senya Ali and may not be used or reproduced without prior permission").

2. Include your e-mail address with the statement so that people can contact you for permission to use your material.

3. Add the "Terms and Conditions of Use" or "Legal Information" on the Web page explaining your policy on the use of your material. For example, you may wish to allow reproduction for any personal use as long as the material remains unaltered or for social welfare.

4. Consider registering with the Copyright Office to explicitly protect certain materials. Include prominently displayed copyright notices with any copyrighted material.

Useful Tip

Protecting Your Material

The **copsycape.com** Website has both a free and paid service for protecting your material. You can paste your material in a URL and the site will check other websites for it or you can use the Copysentry service, which will automatically alert you if there are any other websites copying your content.

Use of Password

Your online accounts, computer files, and personal information are more secure when you use strong passwords to help protect them. Short, easy-to-remember passwords can be easily cracked using simple techniques, and may compromise the security of your website or client data.

Windows XP has password options for its folders and files, and using them is an easy process. Password protected files are prevented from unauthorized viewing.

What is a strong password?

The strength of a password depends on the different types of characters (both upper-case and lower-case letters, numbers and symbols) that you use, the overall length of the password, and whether the password can be found in a dictionary. It should be at least 14 characters long.

If the website or service allows long passwords, you could consider using pass-phrases instead of passwords. Online password generators are available and can give you completely random passwords of any level of complexity.

Never use the same password for your e-mail, your computer, or your accounts. If you find it hard to remember a long list of strong passwords (as most people do!), you could consider using a password manager.

Useful Tip

Evaluate the Strength of Your Password

For evaluating the strength of your password, use the tool developed by Microsoft at www.microsoft.com/protect/fraud/passwords/.

ACTIVITY 3.1

WHY SHOULD SOFTWARE BE PROTECTED BY A COPYRIGHT LAW?

In small groups, students will discuss "Why should software be protected by a copyright law?" The group leader from each group will give a presentation to the class based on their discussions.

Software

Software, or programs, are all the electronic instructions that are used to operate computers and related devices. They are divided into two categories: system software and application software. Without software, hardware are useless.

Copyright

A copyright is the exclusive legal right that prohibits copying of intellectual property without the prior permission of the copyright holder. Ethiopian Intellectual Property Office (EIPO)-PO Box 25322, Ras Mekonnen Street, Addis Ababa is the competent administration for copyright in Ethiopia. The e-mail address of EIPO is eipo@ethionet.et. Violation of copyright is punishable in Ethiopia (see Fig. 3.8).

Fig. 3.8: Copyright violation is punishable in Ethiopia

Software Copyright Law

Pirated software is software obtained illegally, for example, an illicit copy of a commercial video game. If you get such software from a friend or buy it, then the original copyright owners are not paid for their work. Also there is a risk of getting inferior goods and, worse, picking up a virus.

Software copyright law affects anyone who uses a computer and particularly businesses. It is a complex area of law that is not widely understood. For example, application software (*e.g.*, commercial software, shareware, freeware, rentalware) and system software are copyrighted. In Ethiopia, the law does not permit illegal copying of computer software.

Software manufacturers do not sell you their software; rather they sell you a license to become an authorized user of it. In paying for a software license, you sign a contract in which you agree not to make copies of the software to give away or resell.

Each software company has a different license; there is no industry standard. Various types of licenses exist. A software license usually consists of:

1. Permissions granted by the creator to the user,
2. Rights granted by the creator to the user,
3. Restrictions placed by the creator,
4. Limitations on the creator's liability,
5. Warranties and warranty disclaimers,
6. Indemnity (security against damage or compensation), and
7. Term/duration of the license.

Violation the terms of the license infringes the legal rights of the creator of the software and can lead to legal action.

The license usually prohibits the following acts:

1. Modification of the software
2. Adaptation of the software
3. Translation of the software
4. Preparing derivative works from the software
5. Decompiling the software
6. Reverse engineering the software
7. Disassembling the software

The Ethiopian Government is expanding ICT infrastructure, which will make people aware of the software copyright issues. So, you must understand why should software be protected by a copyright law.

KEY CONCEPTS

➢ Information and computer security risks arise from the intentional or unintentional misuse of computers, network resources as well as the Internet.
➢ Copyright is the exclusive legal right that prohibits the copying of intellectual property without the permission of the copyright holder.
➢ Copying others is called plagiarism. It involves using the work of others and presenting it as one's own.
➢ Unauthorized intrusion is the use of a computer or network without permission.
➢ Your online accounts, computer files, and personal information are more secure when you use strong passwords to help protect them.

REVIEW QUESTIONS

Fill in the Blanks

1. Violation of information and computer security is ....
2. .... relates to ownership of an original work.
3. Computer software is considered a literary work and is protected by ....
4. Never use the same .... for your e-mail, your computer, or your accounts.

State Whether True or False

1. When the computers are connected to a network and on the Internet, these are exposed to several security risks.
2. Unauthorized copying of computer software is allowed.
3. Ethiopia is not short of laws against copyright infringement.
4. Corrupting, destroying, manipulating or deleting others' data with malicious intent are examples of unauthorized intrusion.

Multiple Choice Questions

1. Which of the following is/are the impact of information and computer security on society?
   (*a*) Employment   (*b*) Privacy   (*c*) Health   (*d*) All of these
2. Information and computer security is used to protect users from
   (*a*) Hackers   (*b*) Hardware failure   (*c*) Software Piracy   (*d*) All of these
3. .... is the use of a computer or network without permission.
   (*a*) Licensed software   (*b*) Unauthorized intrusion   (*c*) Netiquette   (*d*) Firewall
4. A .... is a secret code or string of characters that is used to authenticate an authorized user.
   (*a*) Password   (*b*) Hacker   (*c*) Virus   (*d*) Worm

Match the Following

Column A		Column B
1. Information and computer security risks	(*a*)	International Law on Copyright
2. WIPO Copyright Treaty	(*b*)	Secures online accounts, computer files and personal information
3. Misuse of e-mail	(*c*)	Arise from the intentional or unintentional misuse of computers, network resources as well as the Internet
4. Strong Password	(*d*)	Sending lengthy e-mails

Answer the Following

1. Explain about copyright issues.
2. Explain about software copyright. Describe the dangers of copying others.
3. Give the national and international laws on copyright.
4. How can copying be protected? Explain use of password.

Suggested Activities

1. Why software needs to have a copyright law? Discuss.
2. Discuss how copying affects the right of others and the development of countries in terms of different aspects—social and economical.
3. Work collectively with others and use password appropriately.
4. Discuss rights and wrongs of indiscriminate copying and software piracy.
5. Identify the impact of unauthorized intrusion, manipulating or deleting others' data and prevent misuse of e-mail and its social impact.

Field Trip

Organize a field trip to various educational institutions or business houses in your city to interact with ICT users. Prepare a report on "Information and Computer security" and discuss it in the class.