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Computer Science Class 9 Notes

Chapter 11

Ethical, Social, and Legal Concerns in Computer Usage

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Chapter 11: Ethical, Social, and Legal Concerns in Computer Usage

Computers and digital devices are a big part of daily life, helping with schoolwork, staying in touch with friends, and entertainment — but with these great tools comes the need to use them safely and responsibly. This chapter explores responsible computer usage, including choosing the right hardware and software, and the safe and secure operation of digital platforms through strong passwords, regular updates, Two-Factor Authentication (2FA), and caution around public Wi-Fi, scams, and phishing.

The chapter also covers best practices for online behavior across social media, email, cloud services, and apps; legal and ethical frameworks including privacy laws and data ethics; intellectual property rights (copyright, trademarks, and patents) and software piracy; responsible internet use including safe research and preventing internet addiction and cyberbullying; and finally the broader impact of computing on society across ethical, legal, societal, and economic dimensions.

Learning Objectives

- Describe the importance of using computers safely and responsibly in daily activities
- Identify factors to consider when selecting computer hardware and software for safety, efficiency, and compatibility
- Demonstrate how to create strong passwords and explain the benefits of Two-Factor Authentication (2FA)
- Describe responsible behavior on social media, email, cloud services, and online applications
- Explain privacy laws and the principles of data ethics, including transparency, consent, and accountability
- Identify ethical and legal responsibilities related to intellectual property rights: copyright, trademarks, and patents

- Demonstrate techniques for safe and credible online research, and recognize signs of internet addiction
- Analyze the ethical, legal, societal, and economic impact of computing on society

Key Concepts

11.1 Responsible Computer Usage

Being responsible with technology means making thoughtful decisions when using computers — selecting the right hardware and software, safeguarding data, and using the internet in a way that respects others. Hardware refers to the physical parts of a computer (monitor, keyboard, CPU), while software includes the programs and applications used, such as word processors or games.

Choosing the right hardware and software matters for three reasons. Safety: using outdated or insecure hardware/software (e.g., a computer without updated antivirus software) puts you at risk of viruses and hackers. Efficiency: the right hardware and software help complete tasks quickly (e.g., an old computer struggling to run a new video game). Compatibility: hardware and software should work well together — always check a software package's system requirements against your computer's specifications.

11.2 Safe Operation of Digital Platforms

Safe operation means using digital platforms and devices in a way that protects you from harm. Key practices include: using strong, unique passwords (a mix of letters, numbers, and special characters, e.g., 'B3tterP@ssw0rd!' instead of 'password123'); regular software updates (which often include important security fixes protecting against new threats); being cautious with links and downloads (avoiding unknown links or untrusted downloads, which could contain malware); understanding and adjusting privacy settings to control who sees your information; and avoiding oversharing personal details like your home address, phone number, or school name.

Secure use goes a step further with additional protective measures. Two-Factor Authentication (2FA) adds an extra security layer, requiring a second piece of

information (like a phone code) after the password. Avoid public Wi-Fi (like in cafes or libraries, which is often less secure) for sensitive transactions like online banking. Be aware of scams, especially phishing emails pretending to be from legitimate companies asking for login details. Regularly review account activity for unusual logins or transactions, and back up important data regularly to an external hard drive or cloud service like Google Drive or Dropbox.

11.3 Responsible Use of Social Media, Email, Cloud Services, and Apps

Different digital tools call for different responsible practices. On Social Media (Facebook, Instagram, Twitter), think before you post and avoid sharing personal information like your home address publicly. With Email, be careful opening messages from unknown senders, which could contain harmful links or attachments. With Cloud Services (Google Drive, Dropbox), use strong passwords and avoid sharing sensitive information like passwords or financial details through cloud storage. For Online Applications (games, learning apps, shopping platforms), download only from trusted sources like the Google Play Store or Apple App Store to avoid harmful software.

Privacy Settings let you control who sees your information (e.g., choosing whether Facebook posts are public, friends-only, or private) and should be regularly reviewed and updated. Data Security Measures like strong, unique passwords for each account (e.g., 'S3cur3!Passw0rd' rather than 'password123') are among the simplest and most effective ways to protect your information from unauthorized access.

11.4 Privacy Laws and Data Ethics

Privacy laws are rules set by governments to protect personal information, ensuring companies and organizations handle data responsibly. Unauthorized access to personal information (e.g., hacking someone's email or social media) is illegal and can lead to identity theft or fraud; privacy laws require companies to implement strong security measures like encryption, and companies that fail to protect user data can face legal penalties.

Data ethics is about doing the right thing when collecting, storing, and using information, guided by three core principles: transparency (being clear about

how data is used), respect for privacy (protecting personal information), and accountability (taking responsibility if something goes wrong). Practical ethical guidelines include Informed Consent (always asking permission before collecting data), Data Minimization (only collecting what's needed), Data Security (protecting collected data with strong passwords and encryption), and Accountability (informing affected individuals and fixing problems if a data breach occurs).

11.5 Intellectual Property Rights

Intellectual property rights protect the creations and ideas of individuals and organizations. Copyright is a legal right giving creators control over original works like music, books, movies, and software — no one else can copy or distribute a copyrighted work without the creator's permission. Trademarks are symbols, names, or slogans (like the Nike 'swoosh') that companies use to distinguish their products, protecting brand identity so competitors cannot use confusingly similar symbols. Patents protect new inventions or processes, giving inventors exclusive rights to make, use, or sell their invention for a certain period.

Respecting intellectual property means understanding that copying, sharing, or using someone else's work without permission is both unethical and illegal — for example, downloading movies or software without paying violates copyright law. Software Piracy is the illegal copying, distribution, or use of software; when you buy software, you are buying a license to use it, not the software itself, so sharing it without a proper license is against the law and cheats developers out of the revenue needed to keep creating and improving their products (software piracy is estimated to cost the global economy over $46 billion annually).

11.6 Safe Online Research and Preventing Internet Addiction

When searching for information online, credibility matters: cross-check information across multiple trustworthy sources rather than relying on just one, and be skeptical of sensational or misleading headlines that may spread 'fake news.' To protect privacy during research, use private/incognito browsing for sensitive topics, avoid entering personal information on unfamiliar websites, and avoid clicking suspicious links that seem too good to be true.

Internet Addiction happens when someone spends so much time online that it interferes with daily life — signs include difficulty stopping internet use even at bedtime or study time, and neglecting responsibilities. Strategies to prevent it include setting time limits (e.g., no more than one hour on social media daily), finding offline activities (sports, reading, in-person time with friends), taking regular breaks, using apps that track screen time, and being mindful of how being online affects your mental health.

11.7 Social Networking Safety and Online Etiquette

Safe social networking involves adjusting privacy settings (e.g., setting an Instagram account to 'private' so only approved followers see content) and practicing good online etiquette — being respectful, using polite language, avoiding arguments, and not spreading rumors or false information, even when disagreeing with someone's post.

Cyberbullying involves using the internet to harm or harass others, such as sending mean messages, spreading rumors, or posting embarrassing photos without permission. If you experience or witness it, report it to the platform and block the person responsible; most platforms provide these tools. Supporting others who are being bullied — by reporting the behavior or offering kind words — can make a real difference, and practicing respectful interactions online (just as you would in person) helps maintain a positive digital environment.

11.8 Impact of Computing on Society

Computing affects many aspects of life. The Ethical Impact raises questions about respecting others' work and copyright. The Legal Impact involves privacy laws and internet regulations that protect personal information. The Societal Impact shows how technology changes how we interact — social media connects people globally but can also enable cyberbullying. The Economic Impact includes new industries and jobs created (like software development and digital marketing) alongside the displacement of some traditional roles through automation.

Computing has transformed global trade (online shopping platforms like Amazon and Daraz), communication (instant messaging and video calls connecting people across distances), and cultural evolution (platforms like YouTube and

Instagram letting people share traditions globally). Computing advancements bring benefits (social networking keeps people connected) alongside risks (misinformation can mislead people and spread quickly). Designing computing systems also involves trade-offs: Privacy vs. Usability (strong passwords and 2FA improve security but add inconvenience) and Security vs. Usability (highly secure systems can be harder to navigate) — the goal is balancing strong protection with ease of use.

Important Definitions

What is Two-Factor Authentication (2FA)?

A security method that adds an extra layer of protection to an account by requiring a second piece of information, such as a code sent to your phone, in addition to your password.

What is phishing?

A type of online scam using deceptive emails or messages that pretend to be from legitimate companies, designed to trick people into giving away personal login details or information.

What are privacy laws?

Rules set by governments to protect personal information, ensuring companies and organizations collect, store, and handle data responsibly and securely.

What is data ethics?

A set of principles guiding the fair and responsible collection, storage, and use of information, based on transparency, respect for privacy, and accountability.

What is copyright?

A legal right that gives creators control over their original works, such as music, books, movies, and software, preventing others from copying or distributing it without permission.

What is a trademark?

A symbol, name, or slogan used by a company to distinguish its products or services from others, protecting brand identity.

What is a patent?

A legal protection for a new invention or process, giving the inventor exclusive rights to make, use, or sell the invention for a certain period.

What is software piracy?

The illegal copying, distribution, or use of software without a proper license, which is against the law since buying software only grants a license to use it, not ownership of it.

Key Facts and Relations

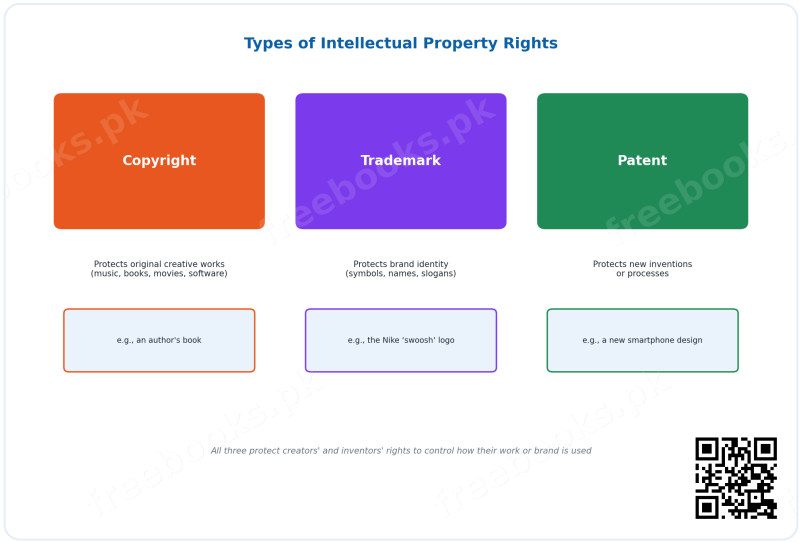
Topic	Key Fact / Relation
3 factors for choosing hardware/software	Safety, Efficiency, Compatibility
3 principles of data ethics	Transparency, Respect for Privacy, Accountability
4 ethical data usage guidelines	Informed Consent, Data Minimization, Data Security, Accountability
3 types of intellectual property	Copyright, Trademark, Patent
Software piracy's global cost	Over $46 billion annually
2013 Yahoo data breach	Exposed data of 3 billion accounts
4 impacts of computing on society	Ethical, Legal, Societal, Economic
2 key computing trade-offs	Privacy vs. Usability; Security vs. Usability

Diagrams

Keeping Your Digital Accounts Safe: A diagram showing the key digital safety practices: strong passwords, Two-Factor Authentication, regular updates, and data backups

Keeping Your Digital Accounts Safe

Types of Intellectual Property Rights: A comparison diagram of Copyright, Trademarks, and Patents, showing what each protects and a real-world example



Types of Intellectual Property Rights

The Impact of Computing on Society: A four-quadrant diagram showing the Ethical, Legal, Societal, and Economic impacts of computing technology

The Impact of Computing on Society

Short Questions & Answers

What is the importance of using computers safely and responsibly?

Using computers safely and responsibly protects our personal information, helps us make wise choices about hardware and software, and ensures our online behavior is respectful and ethical toward others.

Why should you create strong, unique passwords for your accounts?

Strong, unique passwords make it much harder for someone to guess your password and gain unauthorized access to your accounts, protecting your personal information from theft or misuse.

What is Two-Factor Authentication (2FA), and why is it useful?

2FA is a security method requiring a second form of verification (like a phone code) in addition to a password, making it significantly harder for someone to hack into an account even if they know the password.

Why is it a good idea to avoid using public Wi-Fi for sensitive transactions?

Public Wi-Fi networks are often less secure than private networks, making it easier for hackers to intercept sensitive data like banking information during a transaction.

What is the difference between copyright, trademarks, and patents?

Copyright protects original creative works like books, music, and software; trademarks protect brand identifiers like logos and names; and patents protect new inventions or processes, giving inventors exclusive rights for a set period.

What is software piracy, and why is it harmful?

Software piracy is the illegal copying, distribution, or use of software without a proper license; it is harmful because it cheats software developers out of the revenue they need to continue creating and improving their products.

How can you identify reliable sources when researching online?

Cross-check information across multiple reputable sources, check the author's credentials, and be skeptical of sensational or misleading headlines that may indicate unreliable or false information.

What are some signs that you might be developing an internet addiction?

Signs include finding it hard to stop using the internet even when it's time to sleep or study, and neglecting responsibilities like homework in favor of spending hours online.

Long Questions & Answers

Discuss the importance of responsible computer usage in today's digital world, explaining how selecting the right hardware and software can affect safety, efficiency, and compatibility.

Responsible computer usage has become an absolutely essential skill in today's modern digital world, given just how deeply and thoroughly computers and other digital devices have now become genuinely woven into virtually every single aspect of our own everyday individual lives, ranging from completing schoolwork assignments all the way through to staying properly connected with friends and family members. Being properly responsible with technology specifically means consistently making thoughtful, well-considered decisions regarding precisely how we personally choose to use our own individual computers, which specifically includes carefully selecting appropriate hardware and software, properly safeguarding our own personal data, and using the internet in a way that genuinely respects other people around us. Selecting the correct, appropriate hardware and software for any given particular purpose specifically

matters a great deal for three closely interrelated key reasons. The first of these three key reasons is safety, since making the deliberate choice to rely on outdated or otherwise clearly insecure hardware or software can very directly and significantly increase one's own personal risk of falling victim to computer viruses or malicious hackers; a clear, concrete example of this particular risk can be seen in the case of a given computer that has been left running without any properly updated antivirus software actively installed and running on it, since this particular given computer would then likely become considerably easier for various different malicious individuals to successfully infect with harmful software or to otherwise successfully hack into. The second of these three key reasons is efficiency, since properly selecting the correct, appropriate hardware and software for a given particular task can very directly help a given user to actually complete that particular task considerably more quickly and more easily overall; a clear, concrete example of this particular benefit can be seen in the case of someone specifically attempting to run a brand new, demanding video game on a considerably older, outdated computer, since that particular older computer would likely struggle considerably to properly run that particular new game at an acceptable overall speed, thereby making the entire overall gaming experience itself considerably more frustrating and less genuinely enjoyable than it would otherwise be. The third of these three key reasons is compatibility, since a given piece of hardware and a given piece of software specifically need to be able to properly and correctly work well together in combination; in order to properly ensure this particular kind of compatibility, a given user should always specifically check the stated system requirements that are listed on any given software package, and should then properly compare and match those particular stated requirements directly against their own individual computer's own actual specific technical specifications, before actually attempting to purchase or install that particular given piece of software. Taken together as a complete, unified whole, these three closely interrelated key considerations — safety, efficiency, and compatibility — collectively demonstrate precisely why properly and carefully selecting the correct, appropriate hardware and software for one's own personal individual needs represents such a genuinely fundamental and such a truly essential first step toward achieving safe, efficient, and thoroughly responsible overall computer usage.

Explain the concept of data ethics and its importance in handling personal and sensitive information, discussing the principles of transparency, respect for privacy, and accountability.

Data ethics specifically refers to the broader underlying practice of properly and consistently doing the genuinely right thing whenever it actually comes to the process of collecting, storing, and subsequently using various different kinds of individual personal information and data, and this particular concept has become considerably more important than ever before, given just how much personal individual data is now being routinely collected by a great many different various companies, organizations, and digital online platforms on an increasingly regular, near-constant basis. Just because a given organization may technically actually be able to successfully collect a certain particular given amount of individual personal data does not automatically or necessarily mean that this particular given organization should then actually be permitted to subsequently go on and use that particular collected data in absolutely any way that it might otherwise wish to; data ethics specifically exists in order to help properly guide organizations and individuals alike toward using collected information in a genuinely fair, respectful, and properly responsible overall manner. The overarching underlying practice of data ethics itself is generally understood to rest upon three separate closely interrelated core underlying principles. The first of these three core principles is transparency, which specifically means being fully clear and completely open and honest with people regarding precisely how their own particular personal data is actually going to be used by a given organization; a clear, concrete example of transparency in genuine practice can be seen in the specific case of a given website that properly and clearly informs its own individual users, in advance, that it will specifically be tracking their own particular individual browsing activity for certain given specific stated purposes, rather than instead simply doing so secretly and without their own knowledge or consent. The second of these three core principles is respect for privacy, which specifically means actively taking the necessary practical steps to properly protect people's own individual personal information from being improperly accessed, used, or otherwise disclosed to any unauthorized third parties; a clear, concrete example of this particular principle in genuine practice can be seen in the specific case of a given hospital that properly and carefully ensures that its

own patients' individual medical records are kept both fully confidential and also properly secure at all times. The third and final core principle is accountability, which specifically means being fully prepared and willing to properly take genuine responsibility whenever something has unfortunately gone wrong with respect to a given organization's own handling of personal individual data; a clear, concrete example of this particular principle in genuine practice can be seen in the specific case of a given company that has just recently experienced some form of significant data breach, and which then properly and promptly informs all of its own individual affected users about that particular breach, while also simultaneously taking clear, concrete, decisive steps to properly fix the specific particular underlying problem that originally caused that breach to occur in the first place. Taken together as a complete, unified whole, these three closely interrelated core principles — transparency, respect for privacy, and accountability — collectively provide an extremely valuable and genuinely essential overall practical ethical framework that can help to properly ensure that personal individual data is always being handled in a manner that is both fully fair and also properly respectful toward the actual individual people that this particular given data ultimately actually belongs to.

Discuss the different types of intellectual property rights (copyright, trademarks, and patents), and describe the ethical and legal responsibilities related to violating them, such as through software piracy.

Intellectual property rights specifically exist in order to help properly protect the various different original creations, inventions, and individual ideas that are produced by particular individual people and by particular individual organizations, and gaining a genuinely proper, clear understanding of the three separate main particular different types of intellectual property protection — namely copyright, trademarks, and patents — is an absolutely essential foundational step toward properly and fully respecting other people's own individual creative and inventive work. Copyright specifically refers to a particular given legal right that grants an original creator direct control over their own particular given original individual creative work, such as a piece of music, a written book, a produced film, or a piece of computer software; a clear, concrete example of copyright in genuine practice can be seen in the specific case of a

given author who has personally written a particular book, since that particular given author alone then holds the sole exclusive legal right to properly decide precisely how that particular book may subsequently be published, shared, or otherwise creatively adapted by other people. Trademarks, by contrast, instead specifically refer to particular given symbols, names, or slogans that a given company specifically uses in order to properly distinguish its own particular products or services from those of its various different direct competitors; a clear, concrete, widely recognized example of a trademark is the well-known Nike 'swoosh' logo, which specifically and directly helps to properly protect that particular company's own overall brand identity by preventing other rival companies from making use of any other similar, potentially confusing symbol of their own. Patents, meanwhile, instead specifically protect entirely new inventions or newly developed processes, by granting the original individual inventor the sole exclusive legal right to personally make, use, or sell that particular given invention for one specific limited, given period of time; a clear, concrete example of a patent in genuine practice can be seen in the specific case of someone who has personally invented an entirely new, genuinely novel type of smartphone device, since that particular given inventor could then choose to properly patent that particular invention, specifically in order to prevent any other rival companies from being legally permitted to manufacture or sell a substantially similar competing phone without first obtaining that inventor's own direct personal permission to do so. Directly and knowingly violating any of these three particular different types of intellectual property rights carries with it both serious significant ethical implications and also serious significant legal implications; software piracy, specifically defined as the illegal copying, unauthorized distribution, or unauthorized general use of a given piece of copyrighted software, represents one particularly clear, especially common real-world example of this particular general kind of serious intellectual property violation. When a given individual person actually purchases a particular piece of computer software, what that particular person is technically actually purchasing is merely a specific limited personal license that grants them the individual legal right to personally use that particular software, rather than that person actually purchasing full legal ownership of the underlying software itself; as a direct result of this important underlying legal distinction, freely copying that particular given software and then subsequently sharing it further with other people, entirely

without first obtaining the original software developer's own proper explicit permission to do so, is quite clearly and directly against the law. Beyond these various serious potential specific legal consequences, engaging in software piracy of this particular kind is also considered to be seriously ethically wrong, primarily because this particular kind of behavior effectively and directly cheats the original hardworking software developers themselves out of the specific financial revenue that they would otherwise have properly and legitimately earned, revenue which those particular developers would then otherwise have been able to use in order to continue actively creating and further improving their own valuable software products over time — with software piracy of this particular kind being estimated to collectively cost the entire global economy well over $46 billion in total lost revenue on a fully recurring annual basis.

Multiple Choice Questions (MCQs)

Why is it important to use computers safely and responsibly? (A) To ensure we can use them more frequently (B) To protect our personal information and make wise choices about hardware and software (C) To make the computer run faster (D) To avoid paying for software

Correct answer: (B) To protect our personal information and make wise choices about hardware and software. Safe and responsible computer usage protects personal information and helps us make wise choices about the hardware and software we use.

What should you check to ensure hardware and software compatibility? (A) The color of the hardware (B) The system requirements on software packages, matched to your computer's specifications (C) The price of the hardware (D) The brand of the hardware

Correct answer: (B) The system requirements on software packages, matched to your computer's specifications. Checking a software package's system requirements against your computer's specifications ensures hardware and software compatibility.

What does Two-Factor Authentication (2FA) do? (A) It makes your password easier to guess (B) It adds an extra layer of security by requiring a second form of verification (C) It removes the need for a password (D) It reduces the need for software updates

Correct answer: (B) It adds an extra layer of security by requiring a second form of verification. 2FA adds an extra layer of security by requiring a second form of verification, such as a code sent to your phone, in addition to your password.

Why should you be cautious when using public Wi-Fi for sensitive transactions? (A) Public Wi-Fi is usually faster (B) Public Wi-Fi networks are often less secure (C) Public Wi-Fi is free (D) Public Wi-Fi always provides encryption

Correct answer: (B) Public Wi-Fi networks are often less secure. Public Wi-Fi networks are often less secure than private networks, making sensitive transactions like online banking riskier to perform on them.

What is an important aspect of responsible use of social media? (A) Sharing personal information like your home address (B) Posting photos without considering privacy settings (C) Being respectful and avoiding sharing sensitive information publicly (D) Ignoring privacy settings

Correct answer: (C) Being respectful and avoiding sharing sensitive information publicly. Responsible social media use means being respectful to others and avoiding sharing sensitive personal information publicly.

What is a key aspect of data ethics? (A) Using data in any way you like (B) Transparency, respect for privacy, and accountability in data usage (C) Collecting as much data as possible (D) Ignoring data security

Correct answer: (B) Transparency, respect for privacy, and accountability in data usage. Data ethics is built on the principles of transparency, respect for privacy, and accountability in how data is collected, stored, and used.

What is software piracy? (A) Sharing software legally with friends (B) The illegal copying, distribution, or use of software (C) Buying software from an official source (D) Updating software regularly

Correct answer: (B) The illegal copying, distribution, or use of software. Software piracy is the illegal copying, distribution, or use of software without a proper license.

How can you verify the credibility of information found online? (A) By checking the number of ads on the website (B) By using multiple reputable sources and checking the author's credentials (C) By looking at the website's design (D) By the website's popularity

Correct answer: (B) By using multiple reputable sources and checking the author's credentials. Credibility is best verified by cross-checking multiple reputable sources and checking the author's credentials, rather than relying on design or popularity alone.

What is the purpose of privacy settings on digital platforms? (A) To make your posts public (B) To control who can see your information and interact with you online (C) To increase the number of followers (D) To automatically share your information

Correct answer: (B) To control who can see your information and interact with you online. Privacy settings let users control who can see their information and interact with them online.

What should you do to ensure data security? (A) Use the same password for all accounts (B) Share your passwords with friends (C) Use strong, unique passwords and enable two-factor authentication (D) Avoid using any security measures

Correct answer: (C) Use strong, unique passwords and enable two-factor authentication. Data security is best ensured by using strong, unique passwords for each account and enabling two-factor authentication where possible.

Quick Revision Summary

- 3 factors for hardware/software choice: Safety, Efficiency, Compatibility
- Digital safety: strong passwords, regular updates, caution with links/downloads, privacy settings, avoid oversharing
- Secure practices: 2FA, avoid public Wi-Fi for sensitive tasks, watch for scams/phishing, review account activity, back up data
- Data ethics: Transparency, Respect for Privacy, Accountability; guidelines: Informed Consent, Data Minimization, Data Security, Accountability
- 3 IP types: Copyright (creative works), Trademark (brand identity), Patent (inventions)
- Software piracy = illegal copying/distribution of software; costs the global economy $46B+ annually
- Preventing internet addiction: set time limits, find offline activities, take breaks, be mindful of mental health

- 4 impacts of computing: Ethical, Legal, Societal, Economic; key trade-offs: Privacy vs. Usability, Security vs. Usability

Exam Tips

- Remember the 3 C's of hardware/software choice: Compatibility, safety (Caution), and efficiency (Capability)
- 2FA = password + a second verification step (like a phone code) — always mention 'extra layer of security' in answers
- Copyright = creative works; Trademark = brand symbols/names; Patent = inventions — a common exam matching question
- Software piracy is illegal because buying software only grants a license, not ownership
- For online research credibility: cross-check sources + check author credentials, don't judge by design or popularity alone
- Computing's 4 societal impacts: Ethical, Legal, Societal, Economic — easy to remember as 'ELSE'