GRADE 10 NOTES

INFORMATION COMMUNICATION SYSTEMS

COMPREHENSIVE HANDBOOK NOTES

Well-organized, simplified learning notes that provide clear, concise information in a logical sequence, making key concepts easily accessible and memorable, enhancing understanding and retention while fostering engagement and facilitating effective study. By providing a clear focus on key ideas, these Mwalimu Consultancy Ltd Notes foster better retention and comprehension, making learning more accessible and enjoyable.

MWALIMU VERSION

For Complete Notes, kindly contact

Mr Isaboke 0746-222-000 / 0753-222-000

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SUMMARY OF STRANDS AND SUB STRANDS

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1.2 Application areas of ICT

1.3 Operating systems

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3.0 INTERNET AND WEB TECHNOLOGIES

3.1 The Internet

3.2 Digital Communication

3.3 Digital Citizenship

STRAND 1: INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

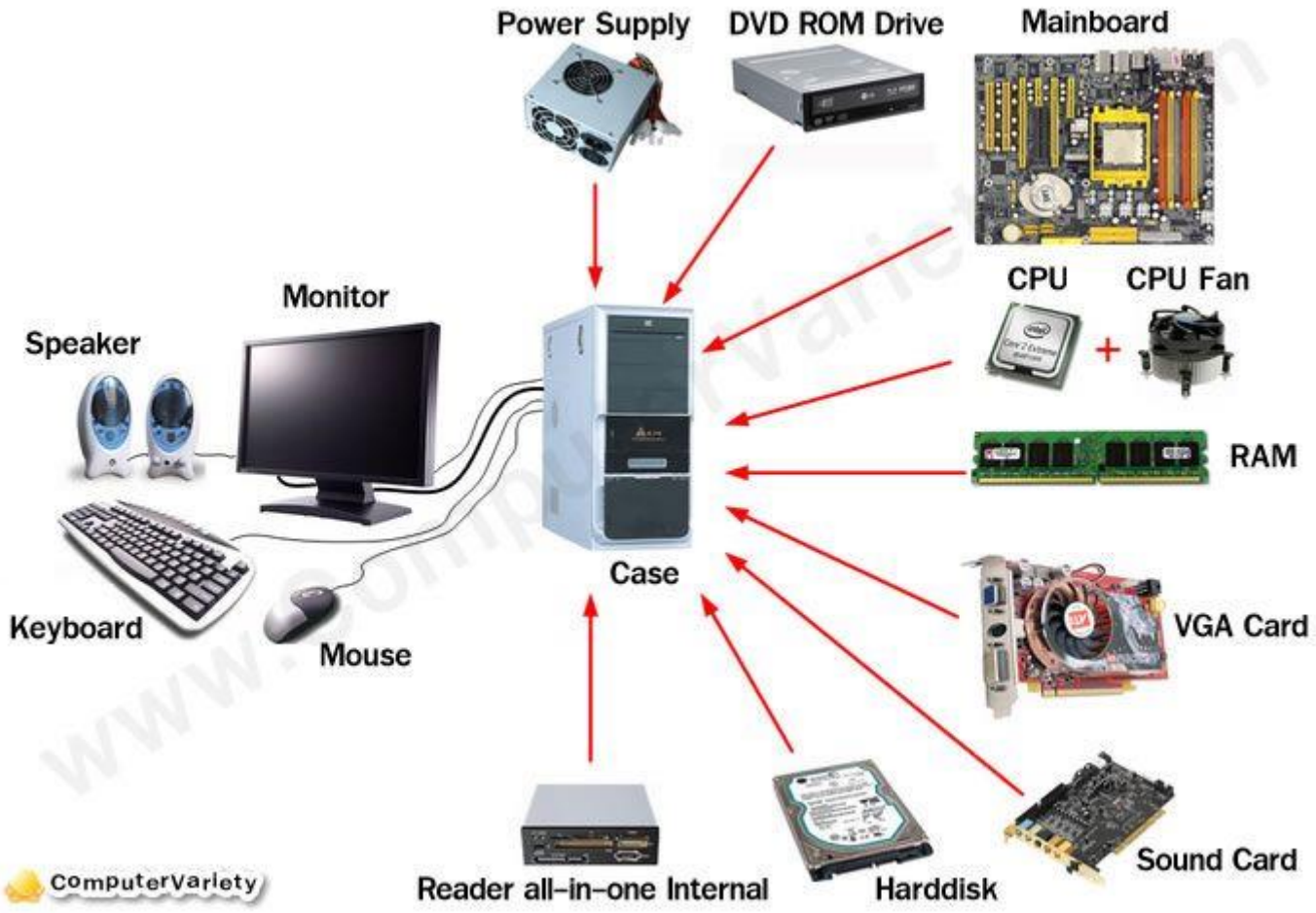
Sub-Strand 1.1: Introduction to ICT

What is ICT?

- ✓ **Information:** Processed data that is meaningful and useful.
- ✓ **Communication:** The exchange of information between two or more entities.
- ✓ **Technology:** The application of scientific knowledge for practical purposes.
- ✓ **ICT:** The intersection of information technology and telecommunications.

Components of ICT in an Organization

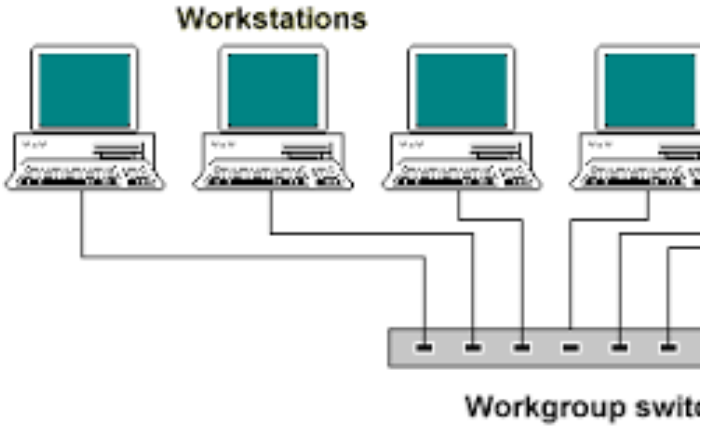
- ✓ **Hardware:** Physical components of a computer system (e.g., CPU, monitor, keyboard).



Computer with labels for hardware components

- ✓ **Software:** Programs that instruct the hardware to perform specific tasks (e.g., operating systems, applications).

- ✓ **Network:** A system of interconnected devices that allows for communication and resource sharing.



Network diagram showing interconnected devices

- ✓ **Data:** Raw facts and figures that are processed into information.
- ✓ **People:** Individuals who use and manage ICT systems.

Importance of ICT in Society

- ✓ **Communication:** Facilitates faster and more efficient communication.
- ✓ **Education:** Provides access to a wealth of educational resources.
- ✓ **Business:** Streamlines operations and improves productivity.
- ✓ **Healthcare:** Improves patient care and medical research.
- ✓ **Government:** Improves service delivery and citizen engagement.
- ✓ **Entertainment:** Provides a wide range of entertainment options.

Suggested Learning Experiences

- ✓ **Brainstorming:** Discuss the meaning of ICT terms and their relevance in daily life.
- ✓ **Research:** Use digital media to search for information on technologies used in communication.
- ✓ **Interactive Activities:** Engage in activities that involve sending and receiving information using ICT devices.
- ✓ **Group Discussions:** Share experiences on the importance of ICT in society.

Key Inquiry Questions

- ✓ How do different digital technologies facilitate communication and information exchange in society?
- ✓ What are the ethical considerations of using ICT?
- ✓ How can ICT be used to solve societal challenges?

SUB-STRAND 1.2: APPLICATION AREAS OF ICT

Application Areas of ICT

ICT has permeated nearly every aspect of modern life. Understanding these application areas helps us appreciate its significance and potential.

1. Education:

- ✓ **E-learning platforms:** Online courses, virtual classrooms, and digital learning resources.



Students using laptops in a virtual classroom

- ✓ **Educational software:** Interactive programs for learning specific subjects.
- ✓ **Online research:** Accessing vast amounts of information for assignments and projects.
- ✓ **Communication:** Connecting students, teachers, and parents through email and online portals.
- ✓ **Administration:** Managing student records, timetables, and communication within educational institutions.

2. Business and Commerce:

- ✓ **E-commerce:** Online buying and selling of goods and services.



Person shopping online using a laptop

- ✓ **Marketing and Advertising:** Utilizing digital channels to reach customers.
- ✓ **Financial Transactions:** Online banking, mobile money transfers, and digital payment systems.
- ✓ **Inventory Management:** Using software to track stock levels and manage supply chains.
- ✓ **Communication and Collaboration:** Email, video conferencing, and project management tools for internal and external communication.

3. Healthcare:

- ✓ **Electronic Health Records (EHR):** Digital storage and management of patient information.



Doctor using a tablet to access patient records

- ✓ **Telemedicine:** Providing remote healthcare services through video conferencing and other technologies.

- ✓ **Medical Imaging:** Advanced technologies like MRI, CT scans, and X-rays that rely heavily on ICT.
- ✓ **Medical Research:** Using computers to analyze large datasets and accelerate discoveries.
- ✓ **Hospital Management Systems:** Managing appointments, billing, and other administrative tasks.

4. Government and Public Services:

- ✓ **E-governance:** Providing government services online (e.g., applying for IDs, paying taxes).
- ✓ **Citizen Engagement:** Using social media and online platforms for communication and feedback.
- ✓ **Law Enforcement:** Utilizing databases and digital tools for crime investigation and management.
- ✓ **Traffic Management:** Intelligent traffic systems that optimize flow and reduce congestion.
- ✓ **Disaster Management:** Using communication technologies to coordinate relief efforts and disseminate information.

5. Communication and Media:

- **Internet and Email:** Fundamental tools for personal and professional communication.
- **Social Media:** Platforms for connecting, sharing information, and building communities.



Various social media logos

- **Digital Media:** Creation and consumption of digital content like videos, music, and podcasts.
- **Online Journalism:** Dissemination of news and information through websites and apps.

6. Entertainment and Leisure:

- **Gaming:** Video games on various platforms (consoles, PCs, mobile).
- **Streaming Services:** Accessing movies, TV shows, and music online.
- **Social Networking:** Connecting with friends and family online.
- **Virtual Reality (VR) and Augmented Reality (AR):** Immersive entertainment experiences.

7. Agriculture:

- **Precision Farming:** Using sensors, GPS, and data analytics to optimize resource use (water, fertilizers).
- **Livestock Management:** Tracking animal health and location using technology.
- **Market Information:** Accessing online platforms for market prices and trends.

8. Transportation:

- **GPS Navigation:** Guiding drivers and providing real-time traffic updates.
- **Online Booking Systems:** For flights, trains, and buses.
- **Intelligent Transportation Systems:** Aiming to improve safety and efficiency of transportation networks.

Suggested Learning Experiences

- **Research:** Use print or digital media to research specific examples of ICT applications in different areas and share findings.
- **Observation:** Visit school or community areas (administration office, accounts office, supermarket) to observe how ICT is used in practice.

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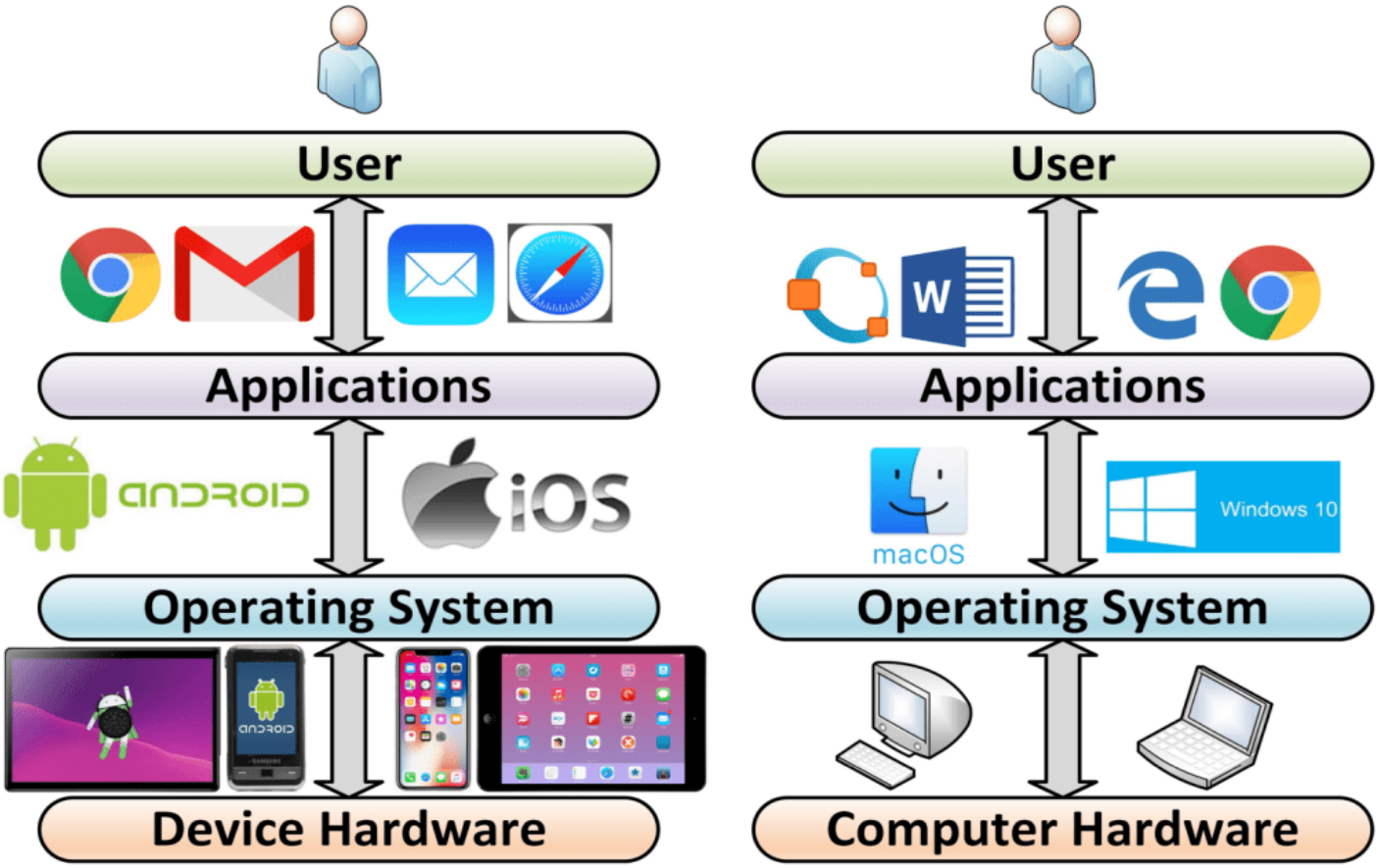
Supermarket checkout with a POS system

- **Discussion:** Discuss the benefits and challenges of using ICT to solve community problems.
- **Sharing Experiences:** Share personal experiences of how ICT has impacted their lives and communities.

SUB-STRAND 1.3: OPERATING SYSTEMS

What is an Operating System (OS)?

An Operating System (OS) is the **most important software** that runs on a computer or any digital device. It acts as an **interface** between the user, the application software, and the computer hardware. Think of it as the **conductor of an orchestra**, managing all the different parts so they work together harmoniously.



[Diagram illustrating the layers of a computer system with the OS in the middle, connecting hardware, applications, and the user.]

```
+--------------------+
|      User          |
+--------------------+
         |
+--------------------+
| Application Software| (e.g., Word, Browser, Games)
+--------------------+
         |
+--------------------+
|  Operating System  | (e.g., Windows, Linux, macOS, Android, iOS)
+--------------------+
         |
+--------------------+
|     Hardware       | (e.g., CPU, Memory, Disk, Peripherals)
+--------------------+
```

Importance of Operating Systems in Digital Devices

1. **Resource Management:** The OS manages the computer's resources, including:

✓ **CPU (Central Processing Unit):** Allocates processing time to different applications.

✓ **Memory (RAM):** Manages how applications use the computer's memory.

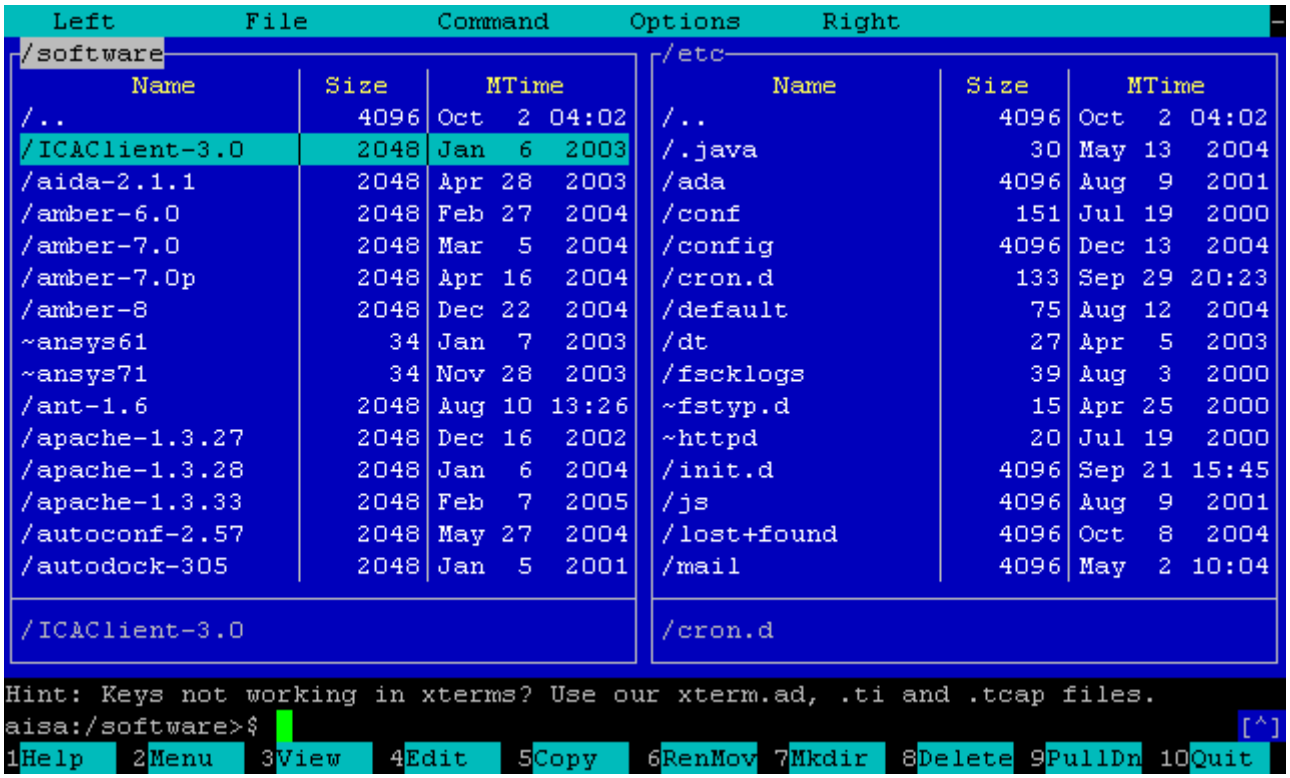
✓ **Storage (Hard Disk, SSD):** Organizes files and folders and manages storage space.

✓ **Peripherals (Printers, Keyboards, Mice):** Enables communication between the hardware and software.

2. **User Interface:** The OS provides a way for users to interact with the computer through either a **Graphical User Interface (GUI)** (using icons, menus, and windows) or a **Command Line Interface (CLI)** (using text-based commands).



[Image showing a typical Graphical User Interface (GUI) with icons and windows.]



[Screenshot showing a Command Line Interface (CLI) with text-based commands.]

3. **Application Execution:** The OS provides the environment for applications to run. It loads applications into memory, allocates resources they need, and manages their execution.
4. **File Management:** The OS organizes files and folders in a hierarchical structure, allowing users to store, retrieve, and manage their data efficiently.
5. **Security:** The OS provides security features to protect the computer system and user data from unauthorized access and malicious software.

Types of Operating Systems Used in Digital Devices

Operating systems are designed for different types of devices and purposes. Some common types include:

1. **Desktop Operating Systems:** Designed for personal computers (PCs) and laptops.

- ✓ **Windows:** Developed by Microsoft, the most widely used desktop OS globally. [Windows logo]
- ✓ **macOS:** Developed by Apple, used on Macintosh computers. [Apple logo]
- ✓ **Linux:** An open-source OS with various distributions (e.g., Ubuntu, Fedora). Known for its flexibility and customizability. [Linux/Tux the penguin logo]

2. **Mobile Operating Systems:** Designed for smartphones and tablets.

- ✓ **Android:** Developed by Google, the most popular mobile OS worldwide. [Android robot logo]
- ✓ **iOS:** Developed by Apple, used on iPhones and iPads. [Apple logo]

3. **Server Operating Systems:** Optimized for running servers that provide services to other computers on a network. Examples include Windows Server and various Linux distributions.
4. **Embedded Operating Systems:** Designed for specific devices with limited resources, such as smart TVs, digital cameras, and industrial control systems. Examples include embedded Linux and specialized real-time operating systems (RTOS).
5. **Operating Systems in Dedicated Digital Devices:** Many specialized devices like ATMs, point-of-sale (POS) systems, and industrial machinery run on customized operating systems tailored to their specific functions. These might not be as feature-rich as desktop or mobile OS but are highly efficient for their intended purpose.

Operating System Interfaces

Users interact with the operating system through different types of interfaces:

1. **Graphical User Interface (GUI):** Uses visual elements like icons, menus, windows, and pointers (usually controlled by a mouse or touch) for user interaction. This is the most common type of interface for personal computers and mobile devices.

[Image showing a desktop environment with icons, windows, and a taskbar.]

2. **Command Line Interface (CLI):** Requires users to type text-based commands to interact with the OS. While less intuitive for beginners, it offers powerful control and automation capabilities. Often used by system administrators and programmers.

[Screenshot showing a terminal or command prompt with typed commands and system responses.]

3. **Menu-Driven Interface:** Presents users with a series of menus to navigate and select options. Common in older systems and some embedded devices.

[Image showing a menu-driven interface with a list of options.]

Basic Operating System Manipulations

Most operating systems allow users to perform fundamental tasks such as:

- **Changing Desktop Background:** Personalizing the visual appearance of the desktop.
- **Adjusting System Settings:** Configuring display, sound, date/time, and other system preferences.

- **Locating Applications:** Finding and launching installed programs.
- **Managing Windows:** Opening, closing, resizing, and arranging application windows.

File and Folder Management

The operating system provides tools (like **File Explorer** in Windows, **Finder** in macOS, and file manager apps in Linux and mobile OS) to organize files and folders:

- **Navigation:** Browsing through the file system to locate files and folders. [Screenshot of File Explorer (Windows) or Finder (macOS) showing file and folder structure.]
- **Creating:** Making new folders to organize files.
- **Renaming:** Changing the names of files and folders.
- **Moving:** Transferring files and folders from one location to another.
- **Copying:** Creating duplicates of files and folders.
- **Searching:** Finding specific files or folders based on name or content.
- **Deleting:** Removing files and folders from the storage device (often moved to a "Recycle Bin" or "Trash" for potential recovery).

Implementing Security Control Measures on Files and Folders

Operating systems offer features to protect files and folders from unauthorized access:

- **File Permissions:** Define who can access, modify, or execute specific files and folders. Different user accounts can have different levels of access. [Screenshot showing file permissions settings in an operating system.]
- **User Access Controls:** Manage user accounts and their privileges on the system. Requiring passwords for login is a basic form of user access control.
- **Passwords:** Strong passwords protect user accounts and the data associated with them.
- **File Backups:** Creating copies of important files and folders to prevent data loss in case of hardware failure or other issues. Operating systems often have built-in backup utilities.

Appreciating the Use of Operating Systems in a Digital Device

Operating systems are **essential** for using any digital device effectively. They provide the foundation for all other software to run and enable users to interact with the hardware in a user-friendly way. Without an OS, a computer would be just a collection of electronic components unable to perform any meaningful tasks. Efficient file organization and security

measures provided by the OS are crucial for managing and protecting valuable digital information.

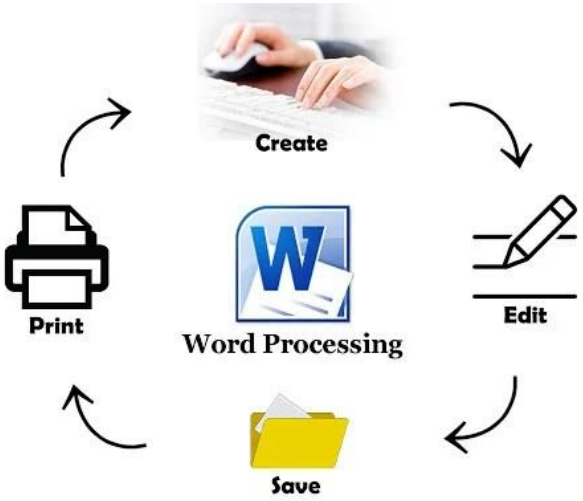
Suggested Learning Experiences

- **Brainstorming:** Discuss the meaning and importance of operating systems in digital devices.
- **Identification and Discussion:** Identify and discuss various types of operating systems used in different digital devices (Windows, Linux, macOS, Android, iOS, and those in dedicated devices like ATMs).
- **Interface Exploration:** Explore different operating system interfaces (GUI, command line - if feasible, menu-driven - through examples).
- **Basic OS Manipulation:** Practice basic OS tasks like changing the desktop background, adjusting system settings, and locating applications.
- **File Explorer/Finder Usage:** Use the file explorer (or equivalent) to navigate the computer system.
- **File and Folder Manipulation:** Engage in activities involving creating, renaming, moving, copying, searching, and deleting files and folders.
- **Security Feature Application:** Explore and apply operating system features for file security, such as understanding file permissions (demonstration if direct manipulation is not possible), user access controls (understanding the concept of passwords), and the importance of file backups.

STRAND 2: PRODUCTIVITY TOOLS

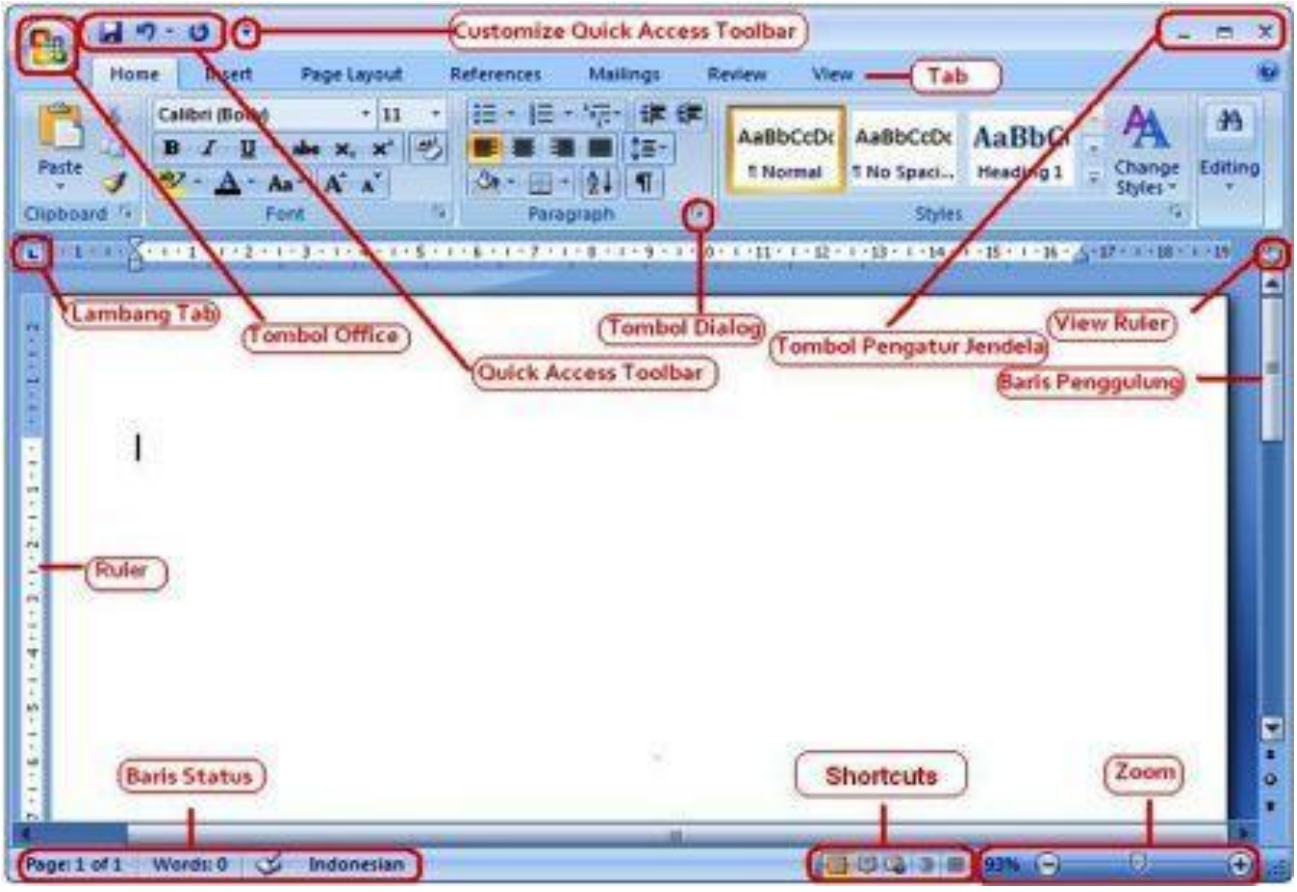
SUB-STRAND

2.1: Word Processing



What is Word Processing?

Word processing involves using computer software to create, edit, format, store, retrieve, and print text-based documents. It has revolutionized how we produce written communication, offering far more flexibility and features than traditional typewriters.



Importance of Word Processing in Document Production

1. **Efficiency:** Speeds up the process of creating and editing documents. Mistakes can be easily corrected without retyping entire pages.
2. **Flexibility:** Offers a wide range of formatting options to enhance the appearance and readability of documents (fonts, sizes, colors, alignment, etc.).
3. **Organization:** Facilitates the organization of text using features like headings, bullet points, numbering, tables, and sections.
4. **Professionalism:** Enables the creation of professional-looking documents for various purposes (reports, letters, essays, etc.).
5. **Collaboration:** Many word processors offer features for collaboration, such as track changes and comments, allowing multiple users to work on the same document.
6. **Storage and Retrieval:** Documents can be saved electronically, making them easy to store, organize, and retrieve as needed.
7. **Sharing:** Documents can be easily shared electronically through email, cloud storage, or printing.
8. **Advanced Features:** Offers tools like spell checkers, grammar checkers, thesaurus, mail merge, and more to improve document quality and efficiency.

Selecting a Word Processing Productivity Tool

Several word processing applications are available, each with its own strengths and features. Some popular options include:

- ✓ **Microsoft Word:** A widely used commercial word processor with a comprehensive set of features.



[Microsoft Word logo]

- ✓ **Google Docs:** A free, web-based word processor that allows for real-time collaboration.



[Google Docs logo]

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- ✓ **LibreOffice Writer:** A free and open-source word processor, part of the LibreOffice suite.



[LibreOffice logo]

- ✓ **Apache OpenOffice Writer:** Another free and open-source word processor.



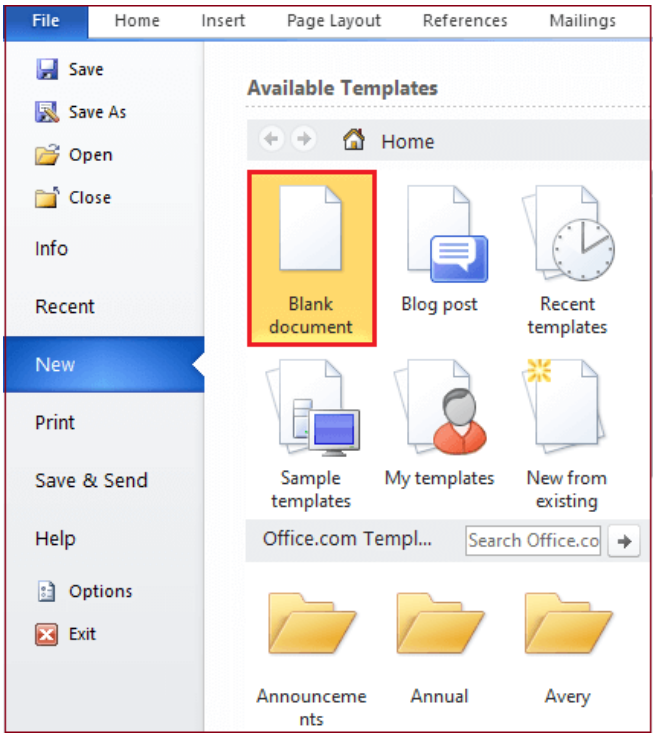
[Apache OpenOffice logo]

- ✓ **WPS Office Writer:** A free (with paid upgrades) word processor with a user-friendly interface.

[WPS Office logo]

The choice of tool often depends on factors like cost, required features, ease of use, and the need for collaboration.

Creating a Text Document Using Word Processing Productivity Tools

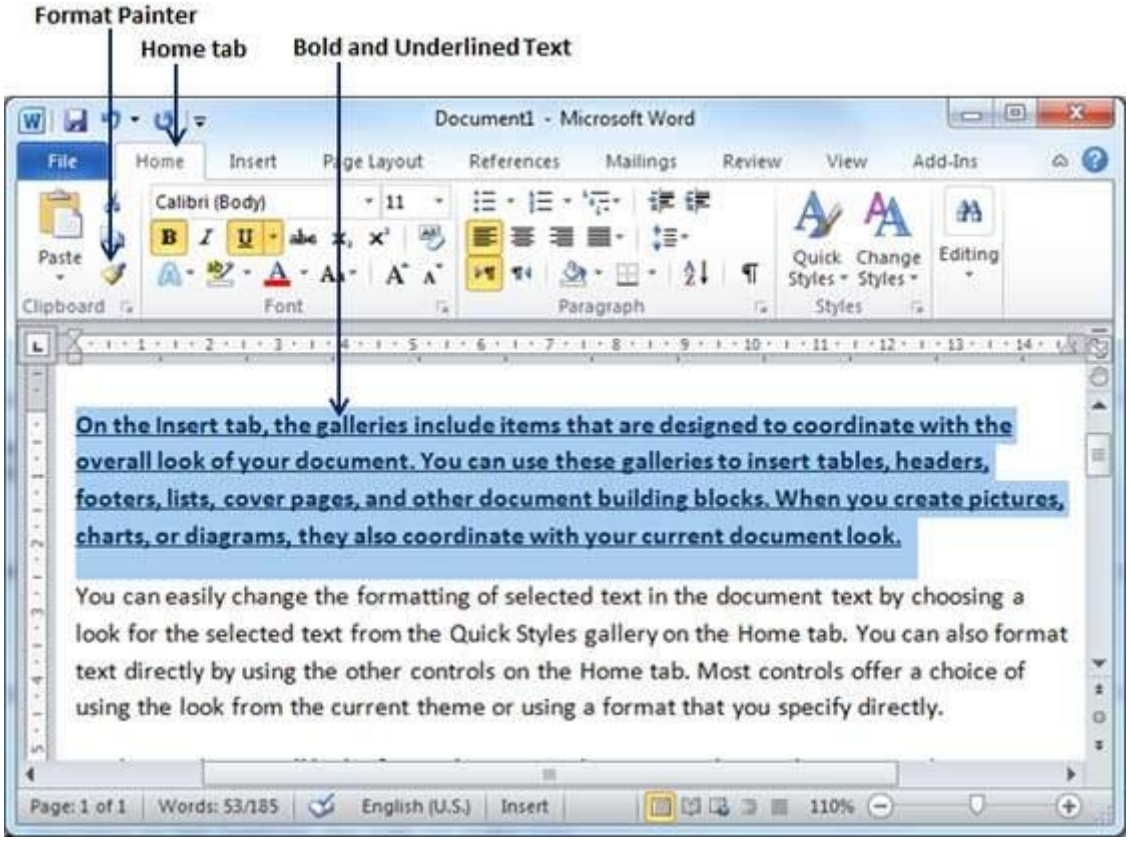


The basic steps for creating a text document generally involve:

1. **Launching the Word Processor:** Opening the chosen application. [Screenshot of a word processing application window opening.]
2. **Typing Text:** Entering the content of the document using the keyboard. [Screenshot showing text being typed in a word processing document.]

3. **Saving the Document:** Storing the document electronically with a chosen filename and format (e.g., .docx, .doc, .odt, .pdf). [Screenshot showing the "Save As" dialog box with options for filename and format.]
4. **Navigating the Document:** Using the scroll bar, keyboard shortcuts (e.g., Ctrl+Home, Ctrl+End), or the navigation pane to move through the document.
5. **Closing the Document:** Exiting the currently open document.
6. **Retrieving a Document:** Opening a previously saved document. [Screenshot showing the "Open" dialog box for selecting a saved document.]

Formatting a Text Document



Formatting enhances the visual appeal and readability of a document. Common formatting features include:

- **Character Formatting:**

✓ **Font:** Changing the typeface (e.g., Times New Roman, Arial).

✓ **Font Size:** Adjusting the size of the text.

✓ **Font Style:** Applying bold, italics, or underline.

✓ **Font Color:** Changing the color of the text.

✓ **Highlighting:** Adding color behind the text to emphasize it.

- **Paragraph Formatting:**

✓ **Alignment:** Aligning text to the left, center, right, or justified.

✓ **Indentation:** Moving the paragraph in from the left or right margin.

✓ **Line Spacing:** Adjusting the vertical space between lines of text.

✓ **Paragraph Spacing:** Adjusting the space before or after paragraphs.

✓ **Bullets and Numbering:** Creating lists with bullet points or sequential numbers.

✓ **Borders and Shading:** Adding borders around paragraphs or applying background color.

- **Page Layout:**

✓ **Margins:** Setting the blank space around the edges of the page (top, bottom, left, right).

✓ **Paper Size:** Selecting the dimensions of the paper (e.g., A4, Letter).

✓ **Page Orientation:** Choosing between portrait (vertical) and landscape (horizontal) layout. [Diagram illustrating portrait and landscape orientation.]

✓ **Page Numbering:** Adding sequential numbers to the pages of the document.

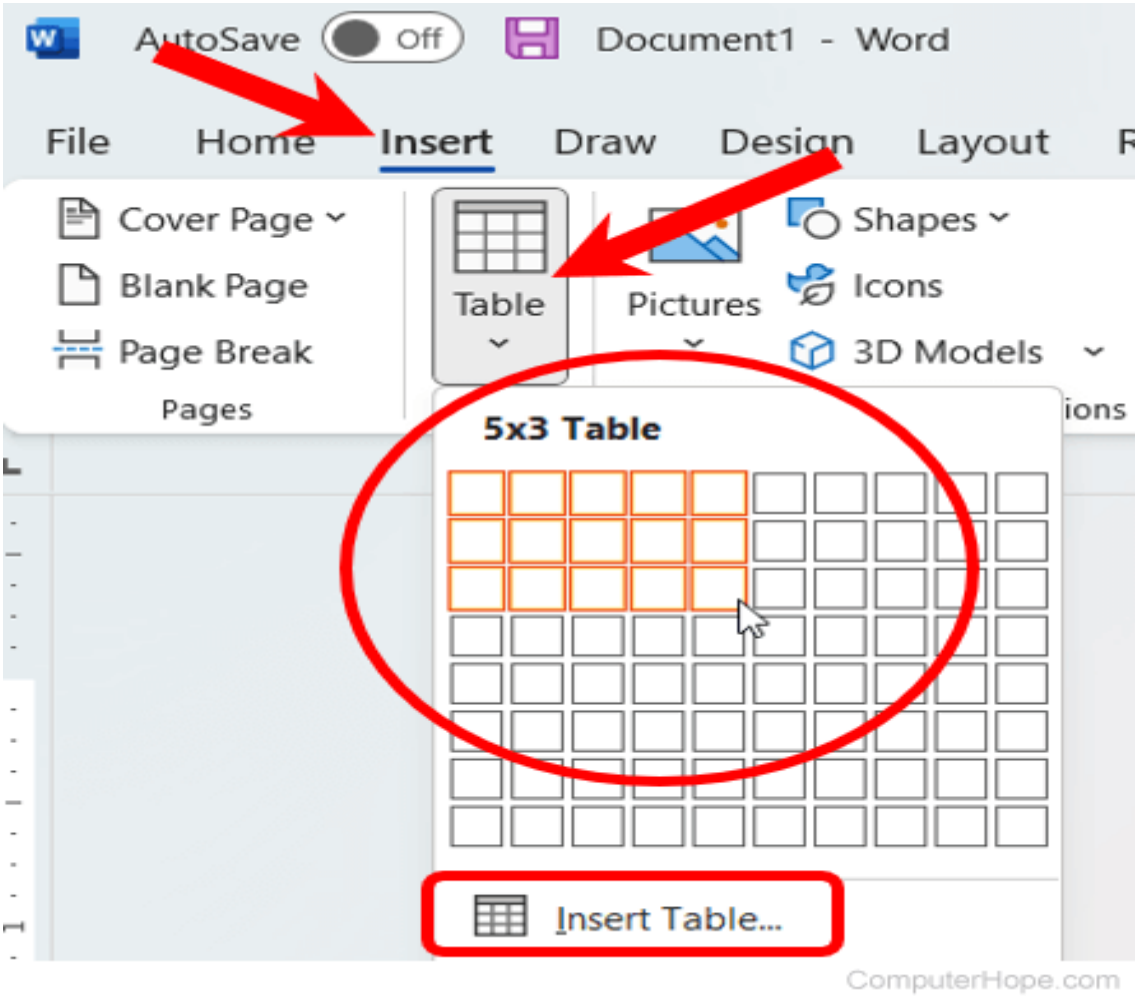
- **Columns:** Formatting text into multiple columns, like in a newspaper.

Using Editing Tools

Word processors provide tools to help improve the accuracy and quality of writing:

- **Spell Checker:** Identifies and suggests corrections for misspelled words. [Screenshot showing a spell checker suggesting a correction.]
- **Grammar Checker:** Identifies and suggests corrections for grammatical errors. [Screenshot showing a grammar checker highlighting a potential error.]
- **Thesaurus:** Provides synonyms and antonyms for selected words. [Screenshot showing a thesaurus suggesting alternative words.]
- **Auto-Complete:** Suggests words or phrases as you type, speeding up the process.
- **Auto-Correct:** Automatically corrects common typing errors as you type.

Inserting and Formatting Tables



Tables are used to organize data in rows and columns:

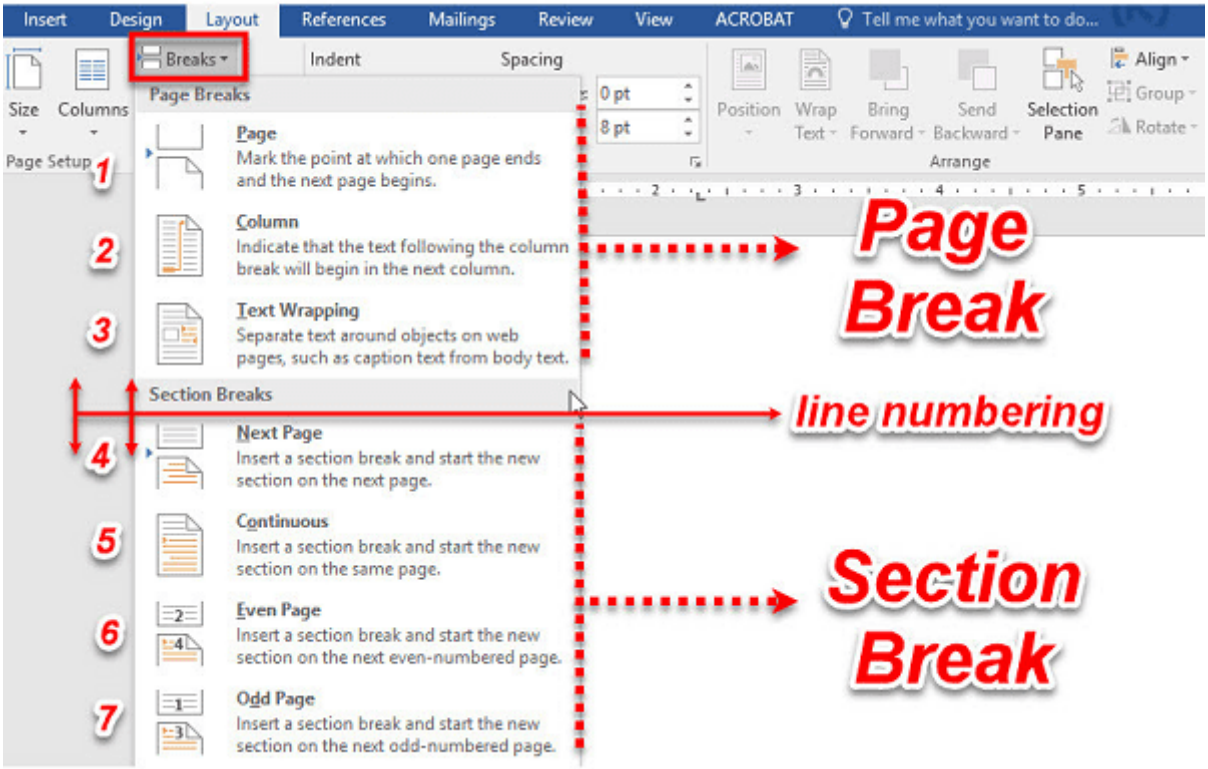
1. **Inserting a Table:** Selecting the number of rows and columns needed. [Screenshot showing the table insertion dialog box.]
2. **Entering Data:** Typing information into the cells of the table.
3. **Formatting a Table:**
   - **Borders and Shading:** Adjusting the appearance of table borders and cell backgrounds.
   - **Cell Alignment:** Aligning text within table cells.
   - **Merging and Splitting Cells:** Combining multiple cells into one or dividing a cell into multiple cells.
   - **Adjusting Row Height and Column Width:** Changing the size of rows and columns.

Inserting and Formatting Table of Figures and Table of Contents

For longer documents, these features help readers navigate:

- **Table of Contents (TOC):** An automatically generated list of headings and subheadings in a document, along with their corresponding page numbers. This requires using heading styles consistently throughout the document. [Example of a Table of Contents.]
- **Table of Figures:** An automatically generated list of figures (images, charts, etc.) in a document, along with their captions and page numbers. This requires properly captioning figures. [Example of a Table of Figures.]
- **Updating:** Both TOC and Table of Figures can be automatically updated if changes are made to headings, captions, or page numbers.

Inserting Section and Page Breaks, Styles, Headers and Footers, Hyperlinks, Cross-Referencing



These features enhance document structure and navigation:

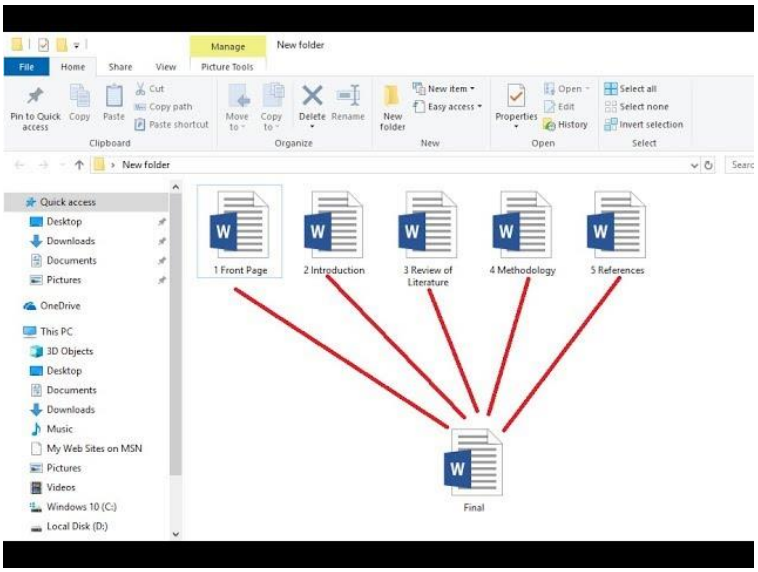
- ✓ **Section Breaks:** Divide a document into sections with different formatting (e.g., different column layouts or page numbering).
- ✓ **Page Breaks:** Force text to start on a new page.
- ✓ **Styles:** Pre-defined formatting options for headings, body text, etc. Using styles ensures consistency and makes formatting changes easier. [Example of a Styles pane in a word processor.]

- ✓ **Headers and Footers:** Text or graphics that appear at the top (header) or bottom (footer) of every page or specified pages (e.g., page numbers, document titles, dates). [Example of a header and footer in a document.]
- ✓ **Hyperlinks:** Clickable text or graphics that take the user to another location within the document, a web page, or another file. [Example of hyperlinked text.]
- ✓ **Cross-Referencing:** Links to specific elements within the document, such as figures, tables, or headings. If the page number of the referenced item changes, the cross-reference can be updated automatically.

Creating and Manipulating Tables

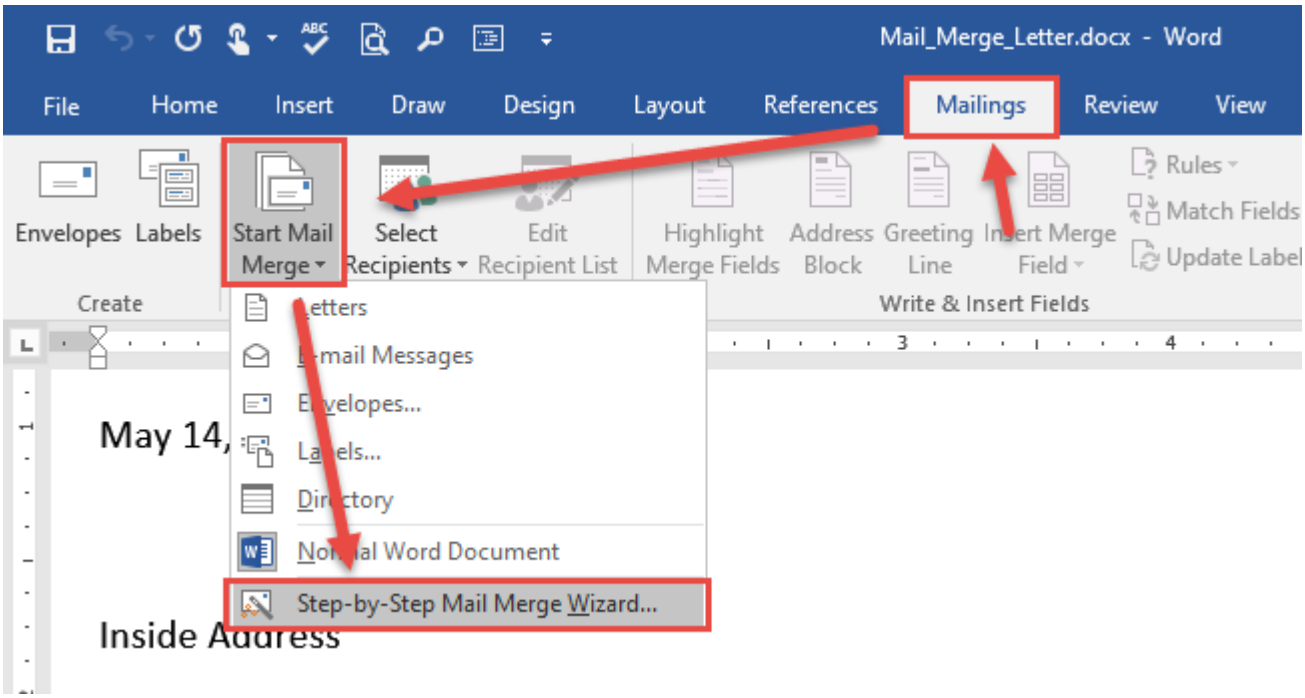
(Covered in the "Inserting and Formatting Tables" section above)

Generating Merged Documents (Mail Merge)



Mail merge is a feature that allows you to create personalized documents (e.g., letters, envelopes, labels) for multiple recipients using a data source (e.g., a spreadsheet or database) containing recipient information.

1. **Creating a Main Document:** The template for the document with placeholders for personalized information.
2. **Creating a Data Source:** A file containing the recipient information (names, addresses, etc.) organized in fields.
3. **Merging the Data:** Linking the data source to the main document and inserting the placeholders (merge fields).
4. **Generating Merged Documents:** The word processor creates individual documents for each record in the data source, replacing the placeholders with the corresponding information.



[Diagram illustrating the mail merge process.]

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- ✓ TOP SCHOOLS MOCKS
- ✓ KPLEA JOINT MOCKS
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