MINISTRY OF EDUCATION

Information Communication Technology

for Senior High Schools

Year 3



Osei Amankwa Gyampo
Kipo Fuseini

MINISTRY OF EDUCATION

Information Communication Technology

for Senior High Schools

Year 2

Osei Amankwa Gyampo
Kipo Fuseini

Ghana Education Service (GES)



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FOREWORD

Ghana's new Senior High School Curriculum aims to ensure that all learners achieve their potential by equipping them with 21st Century skills, knowledge, character qualities and shared Ghanaian values. This will prepare learners to live a responsible adult life, progress to further studies and enter the world of work. This is the first time that Ghana has developed a Senior High School Curriculum which focuses on national values, attempting to educate a generation of Ghanaian youth who are proud of our country and can contribute effectively to its development.

The Ministry of Education is proud to have overseen the production of these Learner Materials which can be used in class and for self-study and revision. These materials have been developed through a partnership between the Ghana Education Service, teacher unions (Ghana National Association of Teachers- GNAT, National Association of Graduate Teacher -NAGRAT and the Coalition of Concerned Teachers- CCT) and National Subject Associations. These materials are informative and of high quality because they have been written by teachers for teachers with the expert backing of each subject association.

I believe that, if used appropriately, these materials will go a long way to transforming our Senior High Schools and developing Ghana so that we become a proud, prosperous and values-driven nation where our people are our greatest national asset.

Haruna Iddrisu MP

Minister for Education

SECTION

1

MULTIMEDIA TOOLS AND APPLICATIONS



ICTS in the Society

Organising, Managing and Presenting Information using Essential Productivity Tools

INTRODUCTION

In this section, you will build on the skills you developed in SHS 1 and 2, where you learned to organise data using tables in Microsoft Word and the benefits of creating charts in Excel. Now, it is time to dive into the world of cloud-based presentation software. You will begin by exploring powerful tools like Microsoft PowerPoint Online and Google Slides, which are transforming how presentations are created. Learn how to design visually appealing slides, format tables and integrate dynamic charts and graphs into your presentations. As you move forward, you will also discover how to add interactivity and hyperlinks to make your presentations more engaging and interactive. This section is designed to enhance your creativity and improve your presentation skills, empowering you to create professional and captivating content that communicates your ideas effectively. Prepare to take your presentations to the next level.

KEY IDEAS

- **Adding Animation and Transitions:** Using animations to introduce text or images on slides in an engaging manner. Applying transitions between slides for smoother flow and a professional appearance.
- **Consistency in Design:** Ensuring consistent formatting and design throughout the presentation. This involves maintaining a uniform colour scheme, font styles and alignment to enhance the professional appearance of the slides.
- **Data Visualisation:** Using charts, graphs and tables effectively to represent data in a visually appealing way. Understanding which type of chart or graph is best suited for the data you're presenting.
- **Interactive Elements:** Integrating hyperlinks and interactive elements (such as buttons or action links) in presentations, which can guide the flow of the presentation or provide additional information.
- **Master Slide:** Understanding the Master Slide feature will allows you to create a unified design for your entire presentation.
- **Presentation Views:** Understanding different presentation views (e.g., Slide Sorter, Normal View and Slide Show mode) to manage and organize organise your slides during the presentation.
- **Slide Development and Formatting:** Creating slides that are visually appealing and well-structured.

Activity 1.1 A simple start to presentations

This activity will activate your prior knowledge on Word, Excel, PowerPoint and cloud services to build your curiosity and set the foundation for learning cloud-based presentation tools and advanced PowerPoint techniques.

Steps:

1. Explain how the "Save" function differs from the "Save As" option in Microsoft Office applications.
2. Explain three advantages of using multiple worksheets within a single workbook in spreadsheet software.
3. Cross out or shade the features of offline PowerPoint you remember.



4. Open a file you previously saved on your computer (e.g., a Word or Excel file containing a table)
5. How will you turn the data in the file into a slide? You can discuss with a friend.

DISCUSSING PRESENTATION SOFTWARE AND ITS FEATURES

In this section, we will explore the key features of presentation software, with a focus on essential aspects such as Windows (User Interface), Animation, Transition, Presentation Views, Slides and Master Slide. Additionally, we will look into Cloud-Based Presentation software and its key features, which have transformed how presentations are created, shared and collaborated on in today's digital world.

Key Features of Presentation Software

1. **Windows (User Interface)**

   The user interface is crucial for efficient interaction with the presentation tool. Most modern software offers a clean and intuitive design with:

   a. Slide Pane: Displaying slides in a thumbnail view for easy navigation.

   b. Editing Window: The main area for adding and editing content (text, images, etc.).

   c. Toolbar (Ribbon): Located at the top or side, it houses tools for text editing, inserting objects and applying transitions/animations.

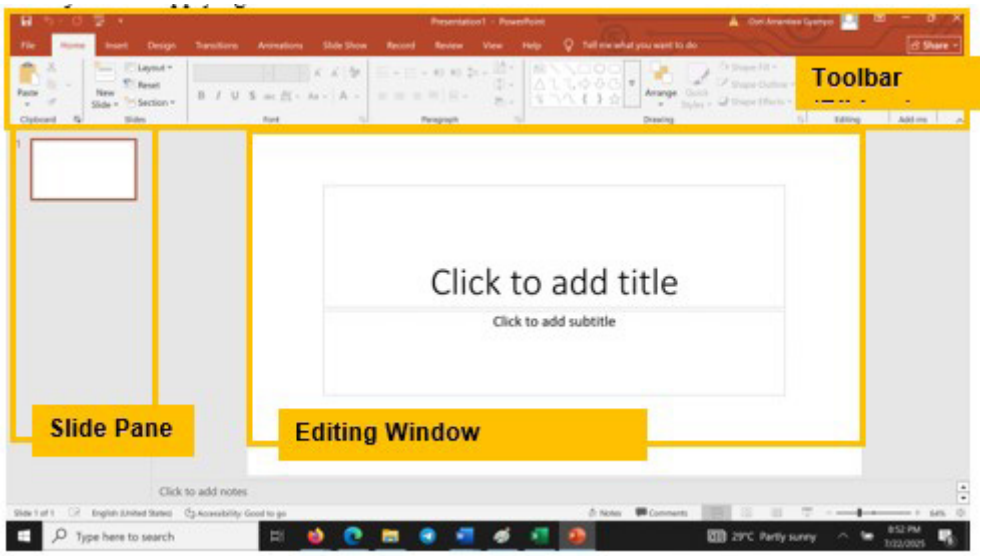


Figure 1.1: Key Features of Presentation Software

2. **Animation**

   Animation adds dynamic elements to presentations, helping engage audiences by creating movement in objects on the slide.

   a. Object Animation: Allows objects like text, charts or images to animate.

   b. Effect Options: Different styles (fade, zoom, fly-in, etc.) to create diverse movements.

   c. Timing: Customisable trigger for animations (on click, after previous, etc.) with speed control.

3. **Transition**

   Transitions control how one slide moves to the next and help set the pace of a presentation.

   a. **Slide Transition Effects:** Effects like fade-ins, wipes or 3D flips to smoothen the slide change.

   b. **Duration and Speed:** Control how quickly or slowly a transition occurs.

   c. **Consistency:** Using uniform transitions or varying them for emphasis.

4. **Presentation Views**

   Presentation software offers several views for different stages of creating and presenting:

   a. **Normal View:** The default mode for editing slides.

   b. **Slide Sorter View:** Displays slides as thumbnails for easy rearrangement.

   c. **Slide Show View:** Full-screen mode to present slides to the audience.

   d. **Presenter View:** Displays the current slide, next slide, speaker notes and timer for the presenter.

5. **Slides**

   Slides are the individual components of a presentation.

   a. Slide Layouts: Predefined layouts (e.g., title, content, blank) for organizing content.

   b. Slide Design: Themes and templates that provide a cohesive and professional look.

   c. Slide Master: A feature that helps apply a consistent design to all slides.

6. **Master Slide**

   The Master Slide is crucial for ensuring uniformity in the presentation's design.

   a. Slide Master View: A view that allows changes (background, fonts, logos) to apply across all slides.

   b. Layout Masters: Defines the content arrangement for specific types of slides.

Cloud-Based Presentation Software and Its Features

Cloud-based presentation software enables users to create, store and collaborate on presentations online. This has revolutionised how presentations are made, especially in collaborative and remote settings. Notable examples include Google Slides, Microsoft PowerPoint Online, Prezi and Canva.



Figure 1.2: Google Slides window

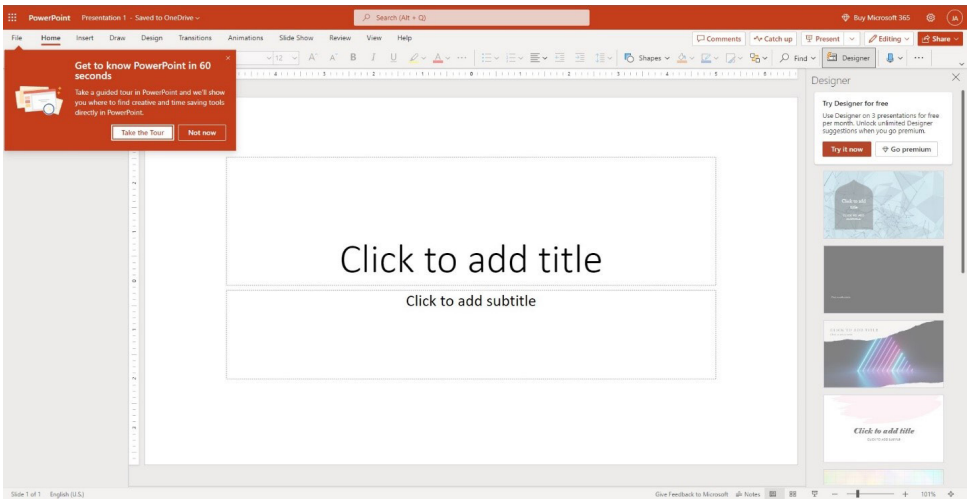


Figure 1.3: Microsoft PowerPoint Online

Key Features of Cloud-Based Presentation Software

1. **Real-Time Collaboration:** Multiple users can work on the same presentation at the same time, with changes reflected immediately for all participants.
2. **Access Anywhere:** Since the software is cloud-based, presentations can be accessed and edited from any device connected to the internet.
3. **Automatic Saving and Version History:** Presentations are automatically saved in the cloud, and version history allows users to track and revert changes if needed.
4. **Cross-Platform Compatibility:** These tools are typically designed to work across multiple operating systems (Windows, macOS, iOS android), making them highly flexible.
5. **Template and Design Tools:** Cloud software offers a variety of templates and design options, allowing users to create professional presentations easily.
6. **Integration with Other Tools:** Cloud-based tools can integrate with services like Google Drive, Dropbox and Microsoft Office, enhancing workflow.
7. **Sharing and Permissions:** Presentations can be shared easily with others, and permissions can be set for view-only or editing access.
8. **Cloud Storage:** Storing presentations in the cloud eliminates the need for local storage and ensures access from anywhere.
9. **Interactive Features:** Cloud platforms often support interactive elements like multimedia, which enhance the viewer's experience.
10. **Presentation Mode:** Many cloud-based tools include presentation modes that let users present slides with controls for pacing, transitions and key point highlights.
11. **Real-Time Analytics and Feedback:** Some cloud software allows viewers to provide real-time feedback or comments on the presentation, which is especially helpful in collaborative settings.

Examples of Cloud-Based Presentation Software

1. Google Slides
2. Canva Presentations
3. Mentimeter
4. Microsoft PowerPoint Online
5. Prezi
6. Zoho Show



Figure 1.4: Examples of Cloud-based Presentation Software

Activity 1.2 Exploring Cloud-Based Presentation Software (Google Slides)

In this activity, you will explore the powerful features of cloud-based presentation software such as Google Slides.

Steps

1. Launch Google Slides and interact with its features, observe and take notes on what seems useful.
2. Engage in a discussion with your colleague, share your opinions on cloud-based presentation tools, especially Google Slides.
3. Create a presentation in Google Slides with your colleague. Include images, text and try out different themes. Once you have completed your slides,
4. Present your work demonstrating how you used Google Slides' features.
5. Reflect on the presentation feedback to improve upon future work

ANIMATION EFFECTS IN PRESENTATIONS

Animation effects are visual effects applied to elements (such as text, images, shapes or slides) in a presentation to make them move, appear or disappear in a specific way. These effects can be applied to make your presentation more dynamic and engaging. In programs like PowerPoint, you can add animation effects to individual elements to catch the audience's attention. For example, you can make text fade in, fly in from the side or zoom in as you move through the slides. Animations can also be used to highlight key points or show step-by-step information (such as adding bullets one at a time). These effects help in

a. Keeping the audience engaged.

b. Emphasising key points during the presentation.

c. Making transitions between slides or content smoother.

Table 1.1: Types of Animation Effect

S/N	TYPE OF ANIMATION EFFECT	DESCRIPTION	EXAMPLE
1	Entrance Effects	Controls how an element appears on the slide. Used to bring content onto the screen.	Fade In, Fly In, Zoom In
2	Emphasis Effects	Highlights or emphasises an element that is already on the slide.	Pulse, Spin, Teeter
3	Exit Effects	Determines how an element disappears from the slide.	Fade Out, Disappear, Fly Out
4	Motion Paths	Moves an element along a specific path on the slide.	Left to Right, Circle Path, Bounce

How To Add An Animation Effect To A Presentation

Steps

1. Open your presentation.
2. Select the object, text, image or shape you want to apply the animation to.
3. Click the 'Animations' tab at the top menu.
4. On the Animations tab, click the more drop-down arrow to display more animation effects.

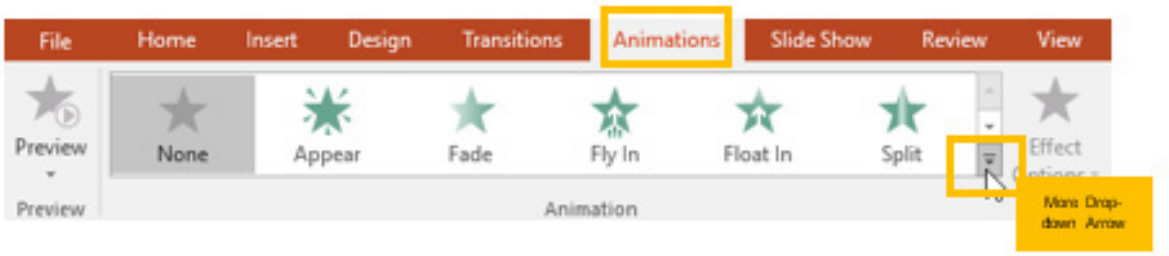


Figure 1.5: Animation Tab

5. Click your desired effect from the options, and the effect will apply to the object.

NB: The animated object will have a small number next to it to show that it has an animation. In the Slide pane, a star symbol will also appear next to the slide.

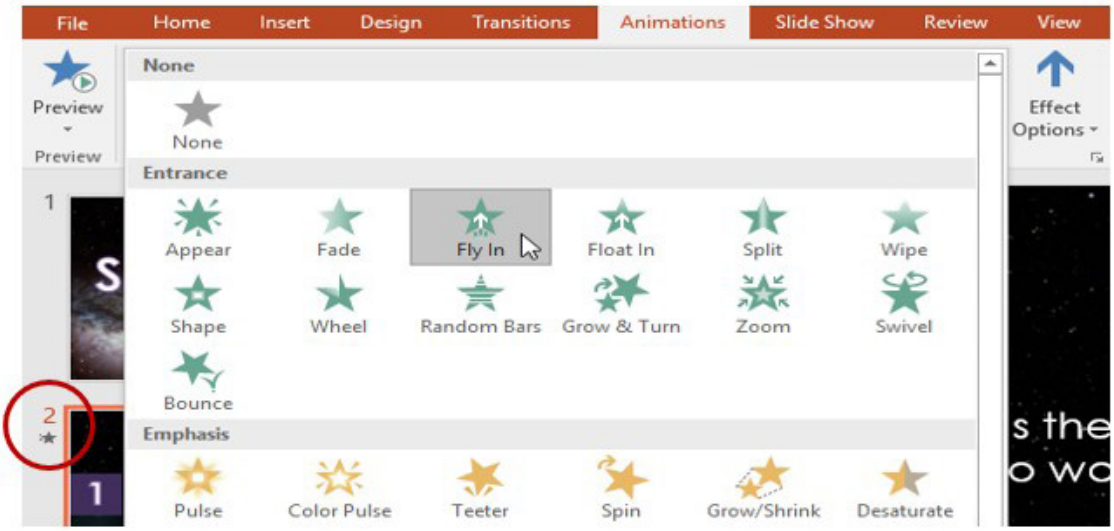


Figure 1.6: Types of Animation Effects

Transition Effects in Presentations

Transition effects are the visual effects that occur when you move from one slide to another in a presentation. They determine how the current slide exits and how the next slide enters, helping to make the flow of the presentation smoother and more engaging. For example, a fade transition gradually fades the current slide out and fades the next slide in. A push transition pushes the current slide out and brings in the next slide, making the transition feel more energetic.

Using transitions helps to:

a. Enhance the presentation by adding variety and maintaining the audience's attention.

b. Create smooth transitions between topics, making the presentation more organised.

c. Control pacing, allowing the presenter to introduce new ideas gradually.

Table 1.2: Types Of Transition Effect

S/N	TYPE OF TRANSITION EFFECT	DESCRIPTION	EXAMPLE
1	Fade	A smooth transition where the current slide fades out and the next slide fades in.	Fade In, Fade Out
2	Push	The current slide is pushed off the screen, and the next slide is pushed in from the same direction.	Push Left, Push Right
3	Wipe	The new slide wipes across the screen, replacing the previous slide.	Wipe Up, Wipe Left
4	Split	The current slide splits into parts (vertical or horizontal), and the new slide comes in.	Split Horizontal, Split Vertical
5	Zoom	The slide zooms in or out, creating a dynamic transition between slides.	Zoom In, Zoom Out
6	Cube	The slide flips like the sides of a cube, giving the effect of rotating to the next slide.	Cube Rotation
7	Flip	The current slide flips over to reveal the next slide, similar to flipping a page.	Flip Horizontal, Flip Vertical
8	Random Bars	The slide is replaced by the new slide through a series of bars or strips coming from different directions.	Random Bars
9	Cover	A new slide is covered by a sheet that moves across the current slide, replacing it.	Cover Right, Cover Down
10	Uncover	The current slide is gradually uncovered by the next slide moving in from one direction.	Uncover Left, Uncover Top

How To Add A Transition Effect To A Presentation

Steps

1. Open your presentation.
2. Click the slide (in the left pane) you want to add a transition to.
3. Click the 'Transitions' tab at the top menu. Click the more drop-down arrow to display more transitions.

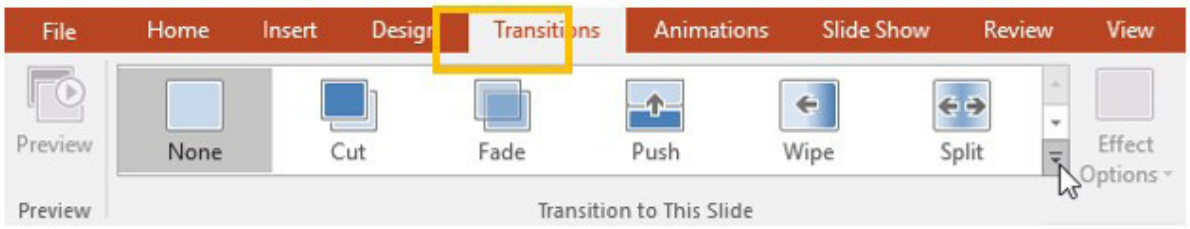


Figure 1.7: Transition Tab

4. Click your desired transition to apply it to the selected slide. This will automatically preview the transition.

NB: *You can use the "Apply To All" command in the 'Timing' group to apply the same transition to all slides in your presentation. Keep in mind that this will modify any other transitions you have applied.*

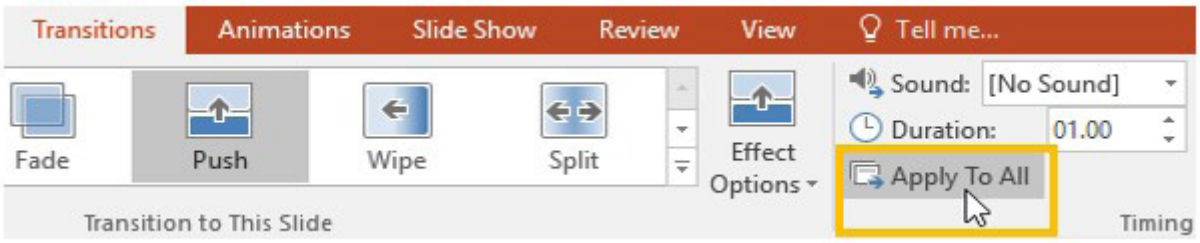


Figure 1.8: Apply To All Tab

Activity 1.3 Learning Animation and Transitions through Videos

You are going to watch a video in this activity to learn about transition and animation effects

1. Scan the QR code or click on the link to watch a video on how to create animations and transitions.

2. Explain the concept of transitional effect and animation effect.
3. After watching the video, apply what you have learned by adding a simple animation to text or an image in a slide and a transition effect between slides.
4. Reflect on the following questions:
   a. What was your favourite animation or transition effect you learned about?
   b. How does using animation and transitions improve the flow of a presentation?

Activity 1.4 Discussing the Advantages of Animations and Transitions

In this activity, you will identify the advantages of animations and transitions

1. Discuss with a partner how animations and transitions help in enhancing engagement, making a presentation more dynamic and guiding the audience's attention.
2. Explain why those advantages are important in making the presentation more effective.
3. Share your findings on the advantages of animations and transitions with a colleague
4. Reflect on why you think using animations and transitions can make a presentation more professional and effective.

PRESENTATION VIEWS

When using presentation software like Microsoft PowerPoint, there are different ways that help you to work on your slides better. These ways are called views. Each view is used for a different purpose, from creating your slides to showing them to your audience.

The table below shows some common views in presentation software

Table 1.3: Presentation Views in Presentation Software

VIEW	DESCRIPTION
Normal View	• This is where you create and design your slides. • You see one big slide and others on the side. • Best for writing text, adding pictures, animations and transitions.
Slide Sorter View	• Shows all slides as small pictures (thumbnails). • Helps you arrange the order of slides and check the flow of your presentation.
Notes View	• Shows the slide with space below to type notes. • Good for writing what you want to say during the presentation.
Slide Show View	• Shows your slides one by one in full screen. This is used to present to an audience. Animations and videos work in this view.
Presenter View	• Similar to Slide Show View, however displays a different view on a second monitor that has notes, next slide, timer.

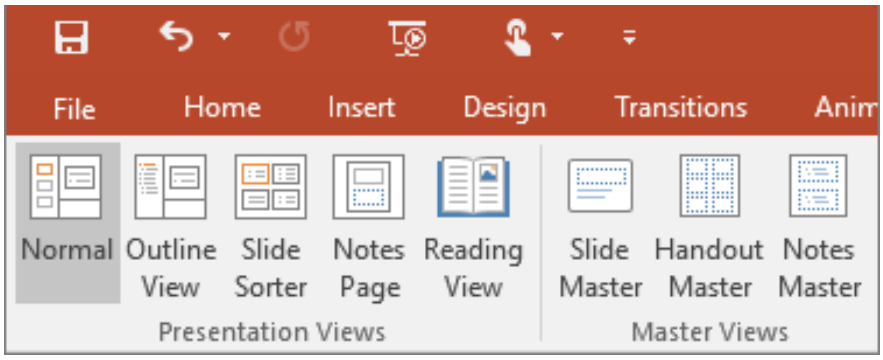


Figure 1.9: Presentation views

How to Use the Views Well

1. **Start with Normal View** to create and design your slides.
2. **Use Slide Sorter View** to arrange your slides in the right order.
3. **Switch to Notes View** to write down key points or reminders for your talk.
4. **Finish with Slide Show View** to present your work clearly and professionally.

Using Themes and Accessibility in Presentations

Themes help make your presentation look nice, neat and professional. When you choose a good theme, all your slides will look similar and organised, which helps your audience follow your message easily.

But making your presentation look good is not enough. You also need to make sure everyone, including people with disabilities, can understand your slides. This is called accessibility.

Below are some important tips to think about when making your presentation easy for everyone to read and understand.

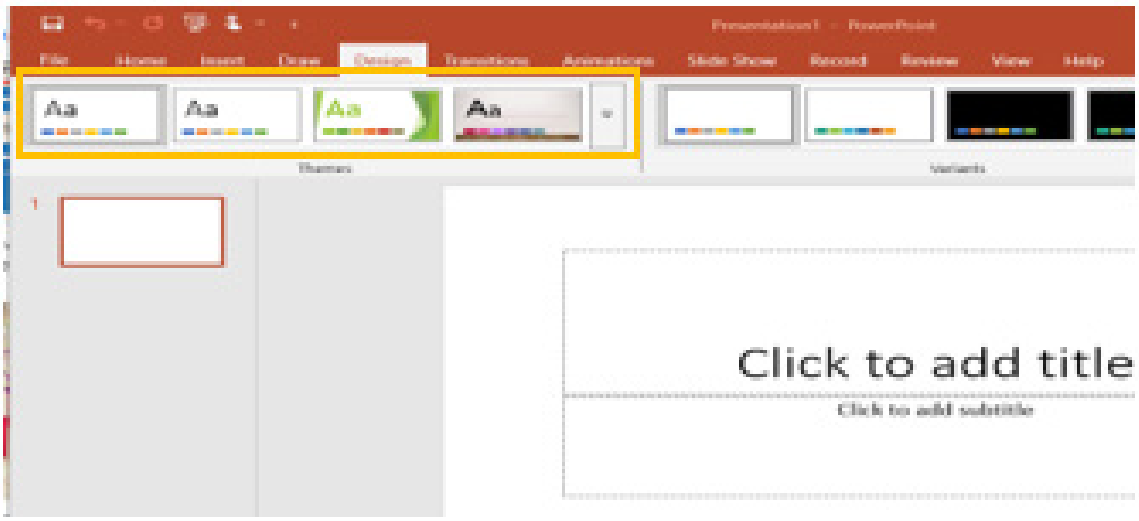


Figure 1.10: Presentation Themes

Table 1.3: Accessibility Tips for Presentations

ACCESSIBILITY AREA	DESCRIPTION / TIPS
Add Alternative (Alt) Text to Pictures	• Alt text is a short explanation of a picture that helps people who can't see well and use screen readers. • It helps them know what the image, chart or diagram is showing. • Make the alt text short but clear, focusing on the main idea of the picture.
Use Fonts That Are Easy to Read	• Pick clean and simple fonts like Arial or Calibri. • Don't use fancy or curly fonts: they can be hard to read. • Use big enough text (at least 24pt) so everyone can read it, even from far.
Use Good Colour Contrast	• Make sure the text colour and background colour are different enough to see clearly. • Don't use red and green together: people who are colourblind may not tell the difference. • Use contrast-checking tools if you're not sure whether your colours work well together.
Make Sure It Works on All Devices	• Try your presentation on a phone, tablet and computer to see how it looks. • Don't use too many fancy animations: they may not work on all devices. • Save your work in formats like PowerPoint or PDF, so everyone can open it.
Why Accessibility Is Important	• It helps everyone, including people with disabilities, understand your presentation. • It makes your slides clearer and your message easier to follow. • It is required in many schools, offices and organisations to make content fair for all.

Slide Master and Layouts

The Slide Master is a tool in presentation software that helps make all your slides look the same. It works like a main template that controls the design of your slides. This includes the background, font style, colours and where text or pictures go. When you use Slide Master, all your slides stay neat, well-arranged and professional.

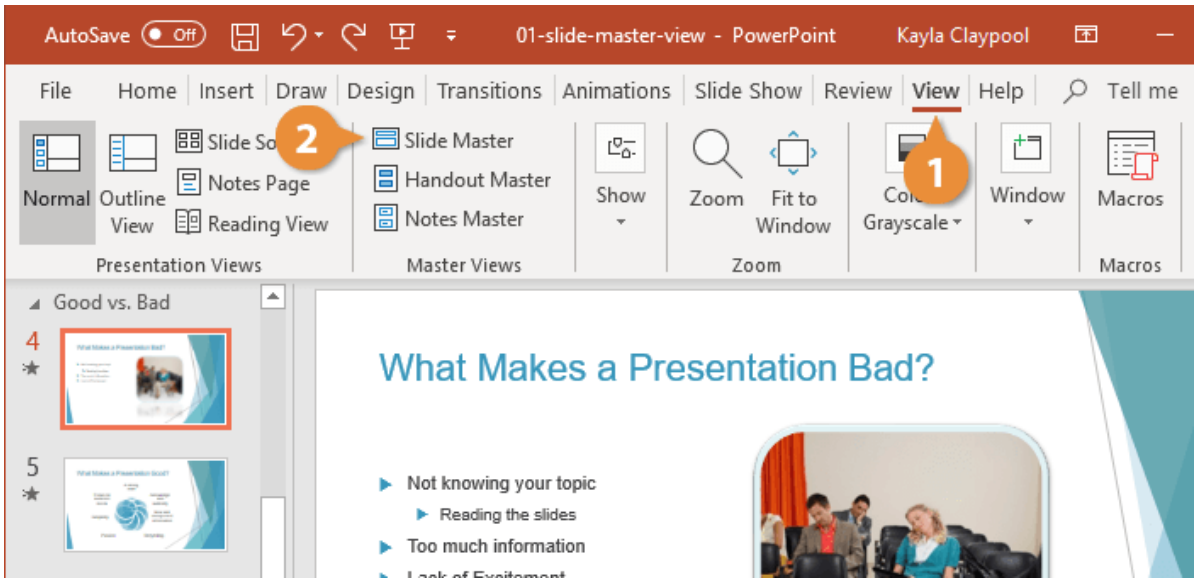


Figure 1.11: Slide master view

Table 1.4: Slide master layout functionalities.

SLIDE MASTER PART	WHAT IT DOES
Background	• You can set one background (colour, image or design) for all slides. • Use simple backgrounds so they don't distract from the main message.
Fonts & Text Formatting	• Choose one font for titles and one for the body text. • Use the same size and spacing to keep it easy to read.
Colour schemes	• Pick colours that go well together. • Make sure the text colour is easy to see on the background.
Placeholders for Content	• These are boxes for text, pictures, videos and charts. • Make sure everything is lined up well so the slides look clean

Why Use Slide Master

a. It saves time by changing all slides at once.

b. Makes your slides look the same and professional.

c. Keeps your colours and design the same everywhere.

d. Easy to update the design without going slide by slide.

Activity 1.5 Exploring Presentation Tools through Interactive Learning

This activity will help you understand different features in presentation software, including presentation views, accessibility options and slide master.

Steps:

1. Recall what you have already learned about presentation software.
2. Using printed handouts with a large font supplied by your teacher, read aloud the questions and write down the responses. (e.g. what is a presentation view?)
3. Click on the link to watch tutorials on:
   a. Presentation views
   b. Accessibility options
   c. Slide master



4. As you watch the tutorials, practice on your devices, then list and explain:
   a. Two reasons for using a specific view
   b. Two reasons for using accessibility options
   c. Two reasons for using a slide master

SLIDE DEVELOPMENT

Slide development is the process of creating and designing individual slides in a presentation, adding content like text, images, graphs and other elements to communicate your message effectively. When developing slides, you focus on organising information clearly, choosing appropriate layouts and using visuals to enhance the presentation.

Table 1.5: Slide Development Procedure

S/N	STEP	DESCRIPTION	EXAMPLE
1	Choose a Clear and Simple Layout	Select a simple and clean layout for your slides that fits your topic. Keep it professional but not too cluttered.	Use a template that fits a school event or educational topic, such as a presentation on "ICT in Education."
2	Add a Strong Title	Make sure each slide has a clear title that tells the audience what the slide is about.	'How ICT is Changing Education in Ghana' for a presentation on the topic of ICT.
3	Use Bullet Points for Key Ideas	Break information into bullet points for easy reading, avoiding large blocks of text.	Use bullet points like: • Improves communication • Makes learning interactive • Increases access to information
4	Incorporate Visuals (Images, Charts, Graphs)	Use images, graphs or charts to help explain your ideas and make the presentation more engaging.	Include a bar graph showing how many students in Ghana use ICT or images of students using laptops.
5	Keep Text Readable	Ensure the text is large enough to read from the back of the room. Use contrasting colours for better visibility.	Use light-coloured text on a dark background for clarity (e.g., white text on a navy background).
6	Add Transitions and Animations Sparingly	Use simple slide transitions and animations only for important points.	Use fade transition between slides or simple animations for bullet points appearing one by one.
7	Focus on One Idea Per Slide	Avoid overcrowding slides with too much information. Stick to one main idea per slide.	Have one slide for "Access to Information" and another for "Improved Communication, "not both on the same slide.
8	Use Consistent Formatting	Stick to one font style for titles and another for the body text. Avoid using too many fonts.	Use Arial for titles and Calibri for body text, keeping the slides consistent and professional.
9	Engage Your Audience	Make your presentation interactive by asking questions or encouraging discussion.	Ask, "How has ICT changed the way you learn in school?" to get your classmates involved.

10	Conclude with a Summary or Call to Action	End with a summary or a call to action to reinforce the key points and leave the audience with something to think about.	End with a slide summarising: ICT enhances learning Improves communication Provides better access to resources. Or suggest: 'Let us use more ICT for better learning outcomes!'

Creating and Formatting Tables in Presentations

Creating and formatting tables in presentations involves adding structured rows and columns to organise information clearly on a slide, making it easier for your audience to understand data or compare different items.

In programs like PowerPoint, you can insert a table to display data neatly. You can format the table by adjusting its size, colours, borders and font styles to make it more attractive and easier to read. This helps organise information like schedules, comparisons or lists in a way that looks professional and is visually clear for the audience.

Table 1.6: Table formatting Activities

S/N	ACTIVITY	PROCEDURE
1	Creating a Table	• Click on the Insert tab. • Select Table from the options. • Drag to select the number of rows and columns you want. • The table will appear on your slide. You can now enter data into the cells.
2	Adjusting Column Widths and Row Heights	• Move your mouse cursor to the border of the column or row you want to adjust. • Click and hold the mouse button. • Drag the border to the left or right to adjust the column width or up and down for row height. • Release the mouse button to set the size.
3	Adding & Deleting Rows/ Columns	To add a row or column • Right-click on a cell where you want to add a row or column. • Select Insert, then choose Insert Rows Above/Below or Insert Columns Left/Right. To delete a row or column: • Right-click on the row/column you want to delete. • Choose Delete Row or Delete Column from the menu.

4	Merging Cells	• Select the cells you want to merge. • Right-click on the selected cells. • Choose Merge Cells from the dropdown menu. • The selected cells will combine into one large cell, useful for titles or headers.

Activity 1.6 Creating and Presenting a Class Timetable

In this activity, you will create and format a class timetable using Microsoft Table tools, applying visual formatting to enhance its clarity and appeal. You may do this activity in groups.

Steps:

1. Create a class timetable using Microsoft Table tools.
2. Apply table formatting techniques to ensure your timetable is neat, visually appealing and easy to read.
3. Enhance your presentation by adding visuals and adjusting the formatting.
4. Open Microsoft PowerPoint and go to the Insert tab. Choose the Table option to create a table for your class timetable.
5. Create a table with the following columns
   a. Days of the Week (e.g., Monday, Tuesday, Wednesday, etc.)
   b. Time Slots (e.g., 8:00 AM, 9:00 AM, etc.)
   c. Subjects (e.g., Mathematics, English, Science, etc.)
6. Format your table by adjusting the row heights and column widths to fit the content.
   a. Apply formatting options such as bold text, font sizes and alignment to make the table clear and visually appealing.
   b. Enhance the table visuals by using shading for headers and adjusting the border styles for better readability.
7. Practice how to format and enhance the visuals further by:
   a. Changing the font style and colour for the days and subjects.
   b. Applying cell shading for header rows and specific time slots.
   c. Adjusting text alignment to ensure that all information is neatly placed.
8. In your small groups, share the challenges and successes you encountered while creating your class timetable.
9. Discuss the following with your peers:

a. What formatting techniques helped improve the appearance of your timetable?

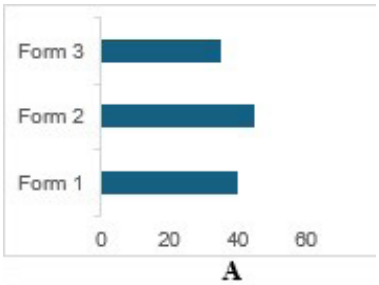
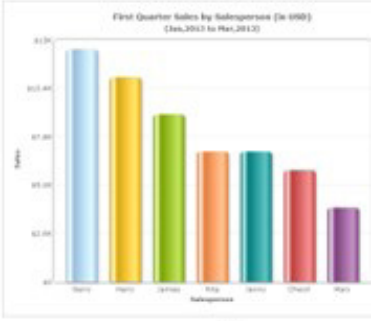
b. How can table formatting enhance readability and user experience for the audience?

10. Collaborate with peers to share tips on making tables more visually appealing and functional.
11. Present your timetable to the class by explaining how you formatted the table, what visual enhancements you applied and how you decided on the content (subject names, time slots).
12. Reflect on the feedback from your peers regarding your design and formatting choices.

CHART AND GRAPH INTEGRATION

Chart and Graph Integration is about combining data in the form of charts and graphs with other elements of a presentation or document to make the information clearer and easier to understand. It is an important skill for presenting data in a more engaging and organised way. By using different chart types like bar charts, line graphs and pie charts, you can convey complex data in a visual format that is easy to digest. It is important to ensure that the charts are accessible with the right supports, such as descriptions, captions and hands-on interaction.

Table 1.7: Types of Charts and Graphs

S/N	CHART TYPE	DIAGRAM	DESCRIPTION	EXAMPLE
1	Bar Charts	 A  B	Used to compare quantities across different categories. Bars can be horizontal (A-Bar charts) or vertical (B-column charts) based on the size of data and preference	Comparing the sales of different products over a year.

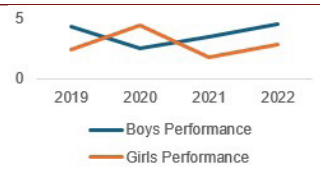
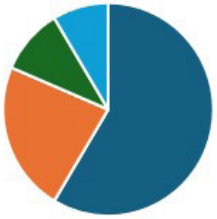
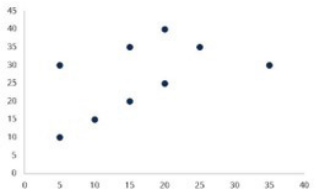
2	Line Graphs		Used to show movements over time.	Tracking temperature changes over a month.
3	Pie Charts		Used to represent parts of a whole.	Showing the percentage distribution of student grades in a class.
4	Scatter Plots		Used to display the relationship between two variables.	Showing the correlation between study time and exam scores.

Table 1.8: Integrating Charts and Graphs

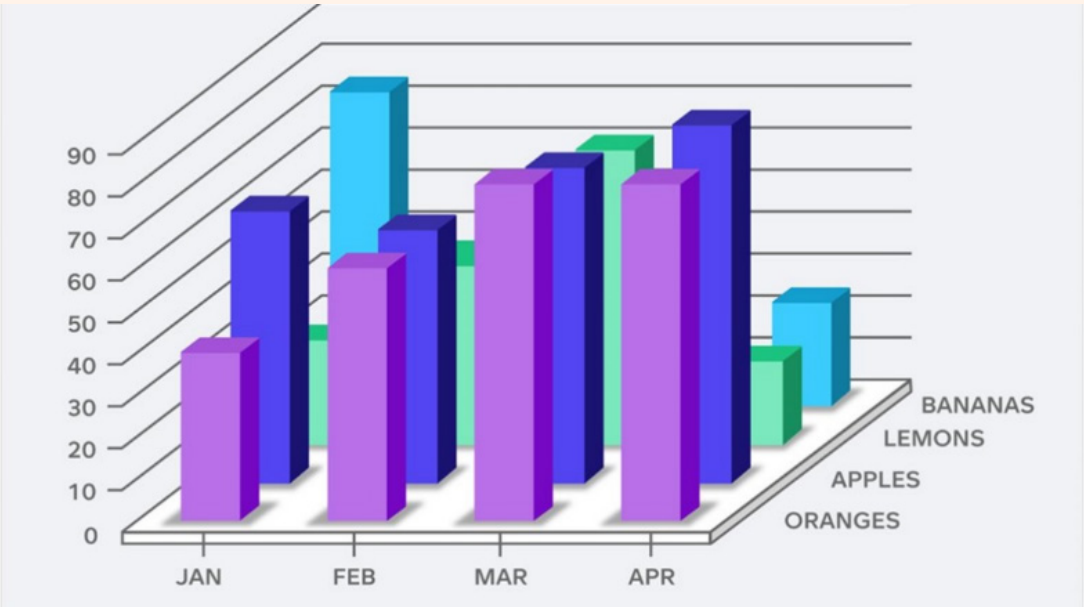
S/N1	STEP	PROCEDURE	EXAMPLE
1	Create the Chart/Graph	• Collect the data you want to represent. • Choose the appropriate chart type (bar, line, pie, etc.) based on the data. • Insert the chart into your slide/document.	• Data Collection: Gather the class's test scores in a table. • Line Graph: Use a line graph to show trends over time. • Pie Chart: Use a pie chart to show percentages of student grades.
2	Insert the Chart/Graph	• In PowerPoint or Word, click on the Insert tab and select Chart. • Add labels and titles to your chart/graph.	• Positioning: Adjust the chart's size and placement to fit the slide layout. • Line Graph: Label the X-axis and Y-axis. • Pie Chart: Add a legend.
3	Enhance and Format the Chart	• Use colours, patterns and text formatting to make the chart visually appealing. • Adjust font size and ensure space for readability.	• Bar Chart: Use contrasting colours to differentiate between categories. • Font Size: Ensure the text is large enough to be easily read.

4	Combine with Other Elements	• Integrate the chart/ graph with tables or text to provide context. • Ensure accessibility for visually impaired learners by providing descriptions.	• Text: Include a short paragraph explaining the chart. • Text Descriptions: Use screen readers to describe the chart or provide written alt text.

Activity 1.7 Poorly Designed Chart

This activity will help you identify and correct a poorly designed chart

1. Use the sample poorly designed chart:



2. Identify the issues with the design, example:
   a. What makes this chart hard to read?
   b. How can we improve this chart for better understanding?
3. Reflect and discuss with a colleague the weaknesses of the chart and suggest improvements.

S/N	Weakness	Improvement
1		
2		
3		

Activity 1.8 Chart Integration

1. Design a PowerPoint Presentation.
2. Integrate a chart into a PowerPoint Presentation.
3. Ensure that the chart is appropriately formatted with titles, labels and legends clearly visible.
4. Share your chart with a colleague, explaining:
   a. Why you chose the chart type.
   b. How you integrated the chart into the presentation.
   c. What message the chart conveys and how it helps in communicating the data clearly.

INTERACTIVITY AND HYPERLINKS

1. Interactivity in ICT

Interactivity in ICT is when a computer or digital content responds to what you do. Instead of just watching or reading, you can interact with the system by giving it instructions, and it will react to you.

For example, reading a book is non-interactive because you are just reading without changing anything. But if you are using an educational app, you can answer questions and the app will tell you if you are correct and give you feedback. Video games are also very interactive because your character moves or does actions based on your commands.

This shows how interactivity makes technology more engaging, allowing you to actively take part in what is happening, instead of just passively receiving information.

Table 1. 9: Reasons why Interactivity in ICT is Essential

S/N	IMPORTANCE	EXPLANATION
1	Engages Users Actively	Interactivity keeps users involved in the process, making them more focused and helping them retain information better than passive learning methods.
2	Improves Learning	Interactive elements like quizzes and games in educational apps provide immediate feedback, reinforcing learning in a more effective way.
3	Enhances Problem-Solving Skills	Interactive apps or games require users to make decisions and solve problems, which enhances their critical thinking and problem-solving abilities.

4	Personalised Experience	Interactivity allows systems to respond to individual inputs, creating a more customised and tailored experience for the user.
5	Instant Feedback	Users receive immediate feedback when interacting with systems, which helps in understanding and correcting mistakes quickly.
6	Increases Motivation and Interest	Interactive content, like games or educational apps, makes learning fun and engaging, encouraging users to stay motivated and involved.
7	Real-Time Updates	Interactive platforms provide real-time updates (e.g., in social media, news apps or collaborative workspaces), keeping users informed instantly.
8	Enhances Creativity and Exploration	Interactive platforms, like design tools or coding platforms, allow users to explore and express their creativity actively, rather than just consuming content.
9	Improves Collaboration	Tools like Google Docs or Microsoft Teams encourage collaborative work by allowing users to interact and contribute to shared projects in real time.
10	Supports Active Learning	Interactive learning tools, like virtual labs and simulations, let learners practice concepts actively, solidifying their understanding through hands-on experience.

Table 1.10: Examples of Interactivity in ICT

EXAMPLE	DESCRIPTION
Online Quizzes and Tests	Interactive quizzes that provide immediate feedback on answers, helping learners assess their knowledge and improve.
Interactive Educational Apps	Apps like Duolingo or Khan Academy that allow learners to engage actively with lessons, complete exercises and get feedback on performance.
Virtual Classrooms	Platforms like Google Classroom or Zoom, where students interact with teachers and classmates through real-time video, chat and collaborative activities.
Video Tutorials with Interactive Elements	Educational videos with clickable annotations, quizzes or links to additional content, allowing learners to engage actively with the material.
Gaming and Gamification in Learning	Educational video games and apps where learners interact with the content by solving problems, earning rewards or advancing through levels.

Interactive Websites and Blogs	Websites where learners can participate in discussions, leave comments or interact with multimedia content, fostering a deeper connection with the material.
Interactive Maps	Tools like Google Earth that allow learners to explore geographic data interactively, zooming in and out or clicking on map points to get more information.
Social Media Learning Communities	Platforms like Twitter or Reddit, where learners interact with educational content, ask questions and share knowledge in an online community.
Online Collaboration Tools	Tools like Google Docs or Padlet that allow multiple learners to work together on projects, make real-time edits and provide feedback.
Simulations and Virtual Labs	Interactive platforms where learners can experiment with simulations (e.g., physics or chemistry labs), actively exploring and manipulating variables to see the effects.

2. Hyperlinks

Hyperlinks are often displayed as underlined text or coloured words, but they can also be images or icons. They make it easy to navigate the internet or documents by linking related information.

For example, in a webpage, when you click on a highlighted word or image, the hyperlink directs you to another page that provides more details on the topic. This makes it easier to explore and connect different pieces of information without searching for them manually.

Think of a hyperlink as a 'shortcut' that takes you to another place instantly. Hyperlinks are a key part of how the World Wide Web works, linking all kinds of information together across different websites and pages.

Table 1.11: Types of Hyperlinks

HYPERLINK TYPE	DESCRIPTION	EXAMPLE	PURPOSE
Text Hyperlink	A word or phrase that is highlighted and clickable.	Clicking on the word 'Visit' opens a website.	Used to link to other pages, websites, or documents.
Image Hyperlink	An image or icon that is clickable and acts as a link.	Clicking on an image to visit a page.	Used to link to resources or information visually.
Anchor Hyperlink	A link that takes you to a specific part of the same page or document.	Clicking on a table of contents link to jump to a section.	Used to navigate within the same document or webpage.

Email Hyperlink	A link that opens the user's default email program to send an email to a specific address.	Clicking on mailto:info@example.com opens an email client.	Used for easy emailing without having to manually type an address.
File Hyperlink	A link that opens a file stored on the computer or in the cloud.	Clicking a link to open a PDF or Word document.	Used to access files like documents, images, or spreadsheets.

Table 1.12: Purpose of Hyperlinks

PURPOSE	EXPLANATION
Navigation	Hyperlinks allow users to easily navigate between different pages, documents or sections of the same page, acting as shortcuts for quick access.
Connecting Information	Hyperlinks link related content together, creating a network of interconnected information, making it easier for users to explore topics in detail.
Enhanced User Experience	Hyperlinks make websites and applications more interactive, improving user-friendliness and keeping users engaged with the content.
Organising Content	Hyperlinks help organise long documents by grouping related ideas and enabling users to jump to specific sections (e.g., in a table of contents).
Efficiency	Hyperlinks allow users to quickly find information, saving time and making the process of accessing relevant content more efficient.
Cross-Platform Connectivity	Hyperlinks connect information across different platforms (websites, emails and documents), allowing for seamless transitions between them.
Call to Action (CTA)	Hyperlinks can act as calls to action, encouraging users to perform specific actions like signing up, purchasing or downloading.

Creating Hyperlinks

In documents or presentations (like in Word or PowerPoint), you can create hyperlinks by selecting a text, image or icon and linking it to a website, document or email address. This is done by right-clicking and selecting the hyperlink option.

Interactivity and Hyperlinks Working Together

Hyperlinks are a fundamental component of interactivity. Clicking on a hyperlink is a user action (input) and the system responds by taking you to the linked content (output). Websites are prime examples where interactivity is heavily reliant on hyperlinks for navigation and accessing information.

Activity 1.9 Exploring Hyperlinks and Interactivity on the GES Website

In this activity you will explore and understand hyperlinks and interactivity through practical use of the Ghana Education Service (GES) website

1. Individually, explain hyperlinks and interactivity and explain how they are used on websites to navigate from one page to another.
2. Find examples of hyperlinks (e.g., clickable text or images) and interactive features (e.g., dropdown menus) commonly found on websites.
3. Open the GES website (www.ges.gov.gh) or your school's website on your device.
4. Explore the website and locate hyperlinks and interactive elements (e.g., clickable buttons).
5. Record your findings and discuss them with your peers.
6. Reflect on the feedback from the discussion.

DESKTOP PUBLISHING (DTP)

Desktop Publishing (DTP) is the process of using software to create and design documents that can be printed or shared electronically. DTP is not just about typing words; it is about arranging text, images and graphics in a way that is clear, appealing and easy to read.

In Ghana, for example, when you see a well-designed flyer advertising a church service, a school event or a community gathering, it was likely created using DTP software.

Table 1.13: Importance of Desktop Publishing

S/N	KEY CONCEPT	EXPLANATION
1	Communication	Desktop publishing (DTP) helps communicate information clearly through visual design, ensuring messages are understood.
2	Professionalism	A well-designed document enhances professionalism, capturing attention and giving a polished, credible appearance.

3	Creativity	DTP allows you to use creativity to produce designs that represent your ideas, culture or values, making the work unique.
4	Culture and Identity	In Ghana, DTP can be used to showcase cultural identity by incorporating colour, symbols and languages that reflect local traditions, like using Kente patterns or Adinkra symbols for cultural events.



Figure 1.12: Documents created using DTP software

What Software Do We Use for Desktop Publishing?

There are several desktop publishing programs available. Let us focus on the Microsoft Publisher for today, as it is easy to use and commonly available in schools and offices across Ghana. Other software like Adobe InDesign is more advanced, but Microsoft Publisher will be a good starting point.

Getting Started with Microsoft Publisher

Microsoft Publisher is a powerful tool for creating professional-looking documents, even for beginners. Here is how we will start:

Table 1.14: Opening Microsoft Publisher and Choosing a Template

S/N	Step	Description
1	Opening Microsoft Publisher	1. Go to the **Start Menu** on your computer, click **All Programs**, find Microsoft Office and then select **Publisher**. 2. Alternatively, if using Microsoft 365, open the app directly from the desktop or through your web browser.
2	Choosing a Template	1. Once **Publisher** is open, you will see many pre-designed **templates** that you can use. 2. **Templates** save time and help you create professional designs by adding your own content. 3. You can choose from various templates like **flyers**, **brochures**, **posters** and **newsletters**. 4. To begin, choose a **Flyer Template** to start your design.

Table 1.15: Key Tools in Microsoft Publisher

S/N	TOOL	DESCRIPTION
1	Text Boxes	Text boxes are containers where you can add and move text. You can resize them to fit your design. To insert a text box, go to the **Insert tab**, click on **Text Box** and type inside it.
2	Inserting Pictures	Images enhance the appeal of your publication. To insert a picture, **click the Insert tab**, **select Picture** and choose an image from your computer or online source. Ensure images are relevant.
3	Using Shapes and Lines	Shapes and lines are used to decorate or divide sections in your publication. You can add borders around text boxes or images and use shapes to highlight key details (e.g., date, time, location).
4	Designing with Colour	Colour helps make your publication stand out and reflects the message or theme. In Ghana, colours like gold and red have cultural meanings. Use colours that align with the message you want to convey.

Activity 1.10 Common Desktop Publishing Tools

This activity will introduce you to common desktop publishing tools like text boxes, inserting pictures, etc.

Steps:

1. With a colleague, briefly explain what desktop publishing software is and the different types of publications it can help create.
2. Research and record your findings on desktop publishing tools.
3. Present your findings and reflect on the presentation feedback.

Activity 1.11 Creating a School Event Flyer

Let us create a flyer for a school event, like a cultural celebration day. You are going to work in groups. Here is what you can include:

1. Title: "Kumasi Wesley Girls' Cultural Day 2025"
   a. Use a bold, large WordArt style to make the title stand out.
2. Date and Time: Add this in a text box below the title. For example: "Saturday, 15th August 2025 | 10:00 AM".
3. Details: In another text box, write a brief description: "Join us for a day of music, dance, food and fun!"

4. Images: Insert a picture of learners performing a traditional dance or a photo of the school.
5. Location: Include where the event will take place in a smaller text box: "Kumasi Wesley Girls' High School Hall, Main Campus".



Tips for Designing Your Publication

1. Keep it Simple: Do not overcrowd your page with too much text or too many images. Focus on the most important information.
2. Alignment: Use the Align tools to make sure your text, images and shapes are in the right place. For example, centre the title at the top and place the event details below it.
3. Balance: Make sure your page looks balanced. If there is a large image on one side, balance it with text or shapes on the other side.

Saving and Printing Your Work

Once you have finished your design:

1. **Saving:** Click on File and then Save As to choose where to save your file. You can save it on your computer or in the cloud for easy access.

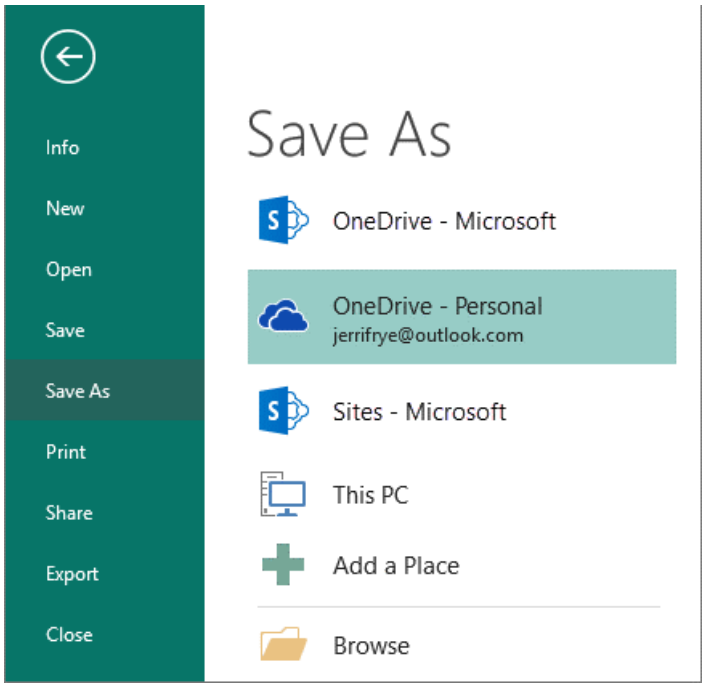


Figure 1.13: Saving your Work

2. **Printing:** If you need to print your work, make sure your printer is set up correctly. Click on File, then Print and select your printer.

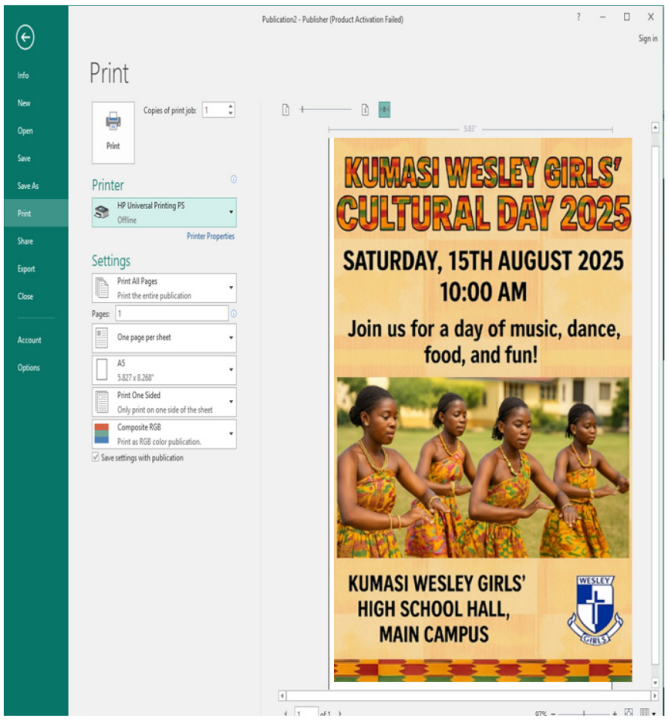


Figure 1.14: Printing a work

Activity 1.12 An Event Flyer

This activity will help you create a beautiful flyer for your school event

Steps:

1. Create a flyer for your next school event or a local community gathering using the tips and tools we discussed.
2. Share your designs with the class. How did you incorporate your culture, colour, and creativity into the design?
3. After completing your design, discuss with your classmates how they would improve their flyer. Focus on how to make the flyer even clearer, appealing and culturally relevant.

   Note

   a. *Always be creative but make sure your design is clear and easy to understand.*

   b. *Be respectful of the diverse cultures and religions in our school community when choosing symbols, colours or images for your designs.*

   c. *Make sure your design represents national values like unity, respect, tolerance, creativity, etc.*

Activity 1.13 Practical Session on Exploring the User Interface of DTP Software

This activity will give you hands-on experience in exploring the user interface of desktop publishing software, focusing on key elements like the ribbon/menu bar, document workspace, etc.

Steps:

1. Identify and briefly explain the main components of the software's user interface (Ribbon/Menu Bar, Document Workspace, etc.
2. Open the DTP software to explore the interface.
3. Navigate through the toolbars and panels, experimenting with different options available.
4. Create a basic document (e.g., a flyer or poster) to practice using the menus and toolbars.
5. Share your experiences with publishing software
6. Work individually or in pairs to create your publication a simple publication (e.g., flyer, poster or brochure) using the tools you have learned about.
7. Discuss the purpose of the publication and any requirements for the project (e.g., including a title, text and image).

8. Ensure to use the ribbon/menu bar, toolbars and panels to insert text, images and shapes.
9. Present your work to the class for feedback
10. Reflect on the feedback on design, use of tools and overall presentation quality.

FEATURES OF DESKTOP PUBLISHING

Text Tools In Desktop Publishing

Text tools in desktop publishing software give you full control over how your text looks and behaves on the page. This is where typography, the art of arranging text becomes vital.

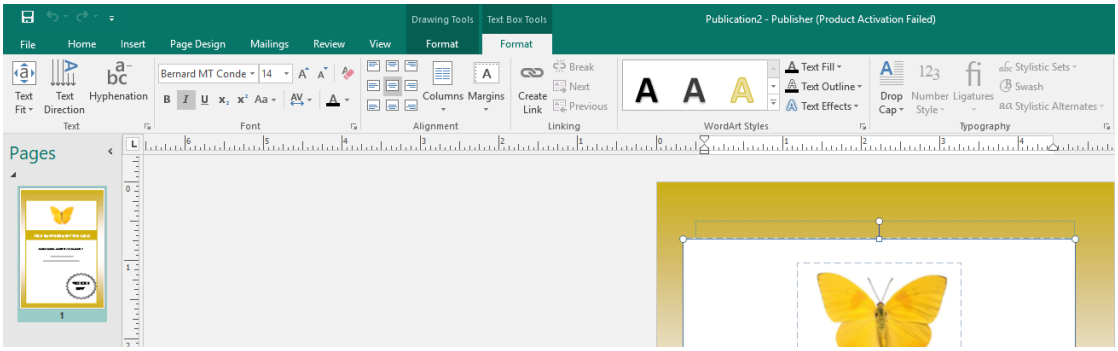


Figure 1.15: Text Tools in Desktop Publishing

Font Selection (Typeface)

Fonts are the different styles in which text is written. Think of it as handwriting; everyone has their own style, and similarly, different fonts give different feelings to your publication.

i. **Serif fonts** (e.g., Times New Roman) are often used for formal documents or printed materials.

ii. **Sans-serif fonts** (e.g., Arial) are clean and modern and often used for headings or digital content.

iii. **Script fonts** are decorative and can give a personal or artistic feel but should be used sparingly.

Choosing the right font is crucial. A formal document may call for something like Times New Roman, while a fun flyer may use a more playful font like Comic Sans or Brush Script.

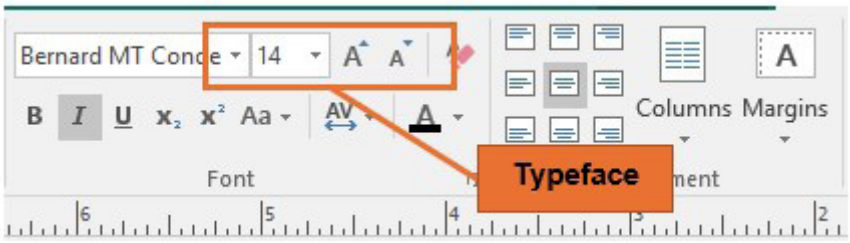


Figure 1.16: Typeface

Font Size

Font size refers to how big or small the text appears. Font size is measured in points (pt).

i. **Headlines** are usually larger to grab attention.

ii. **Body text** is smaller and should be easy to read (typically between 10-14 pt).

When creating a publication, always ensure that the text is large enough for people to read comfortably, especially when it's printed.

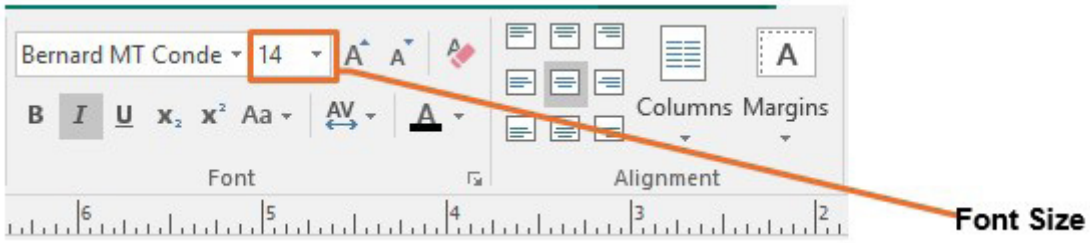


Figure 1.17: Font Size

Font Style

Font styles include variations like bold, italic and underline

i. **Bold:** Highlights important text, such as headings or key points.

ii. **Italic:** Used for emphasis or to indicate titles, quotes or foreign words.

iii. **Underline:** Typically avoided in professional designs, except for web links in digital documents.

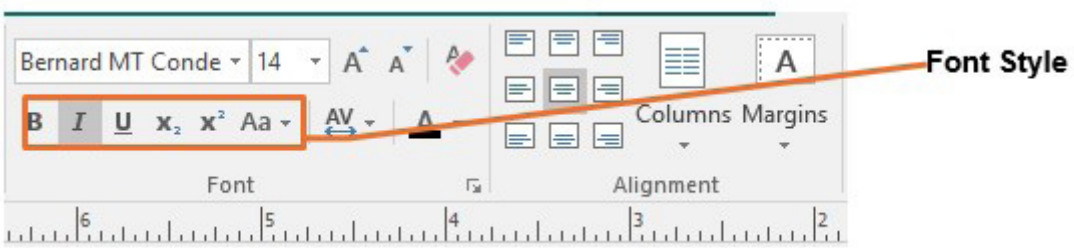


Figure 1.18: Font Style

Alignment

Alignment controls how your text lines up within a text box.

i. **Left-aligned:** Text lines up along the left edge (most common for body text).

ii. **Right-aligned:** Text lines up along the right edge (often used for captions or dates).

iii. **Centre-aligned:** Text is centred, often used for headings or short lines.

iv. **Justified:** Text stretches to fill the width of the text box, making both sides even. Common in books and newspapers, but requires careful management of spacing.

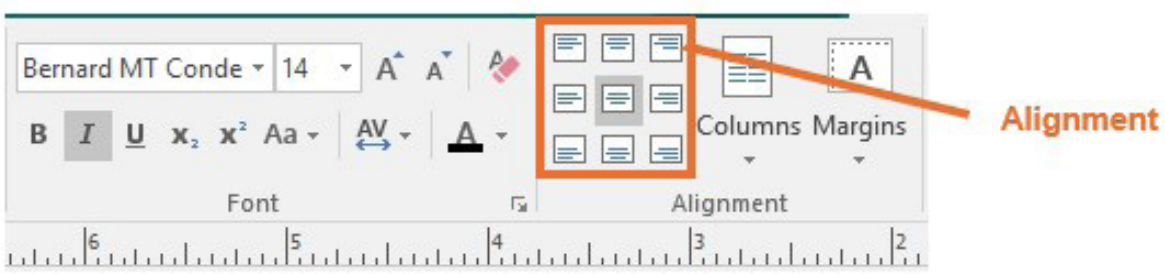


Figure 1.19: Alignment Controls

Activity 1.14 Identifying and Applying Text Formatting

This activity will help you to understand and apply text formatting features, typography principles, and font selection in Desktop Publishing (DTP) software to enhance the readability and visual appeal of different types of publications.

1. Explain common text formatting features in DTP software (e.g., font style, size, colour, bold, italics, underline, alignment).
2. Use visual aids (e.g., slides or examples) to show how different formats affect the appearance of text.
3. In your small groups, each group is to select a text from a given publication (e.g., flyer, newsletter) and apply at least 3 different text formatting features (e.g., changing font, size, alignment).
4. Collaborate to ensure your formatting choices improve the document's appearance and readability.
5. Reflect on the feedback from the discussion.

LINE SPACING (LEADING)

Line spacing, or leading, is the space between lines of text. Too little space can make text feel cramped and difficult to read, while too much space can make the document feel disconnected.

i. **Standard line spacing** is usually set to 1.15 or 1.5 for body text, but you can adjust it based on your design.

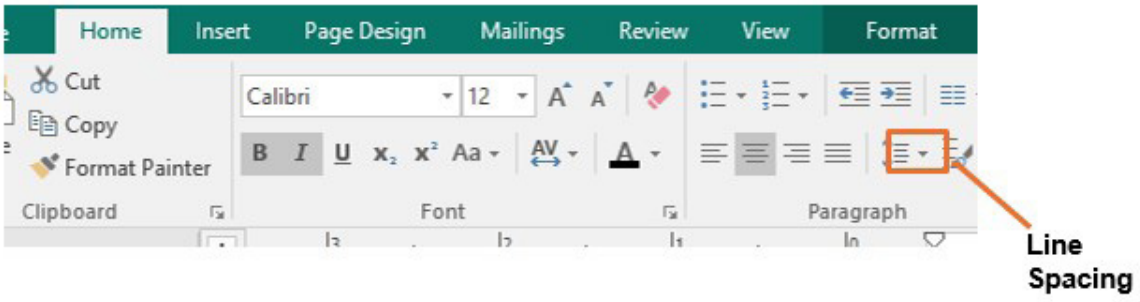


Figure 1.20: Line Spacing

Character Spacing (Kerning and Tracking)

i. **Kerning** refers to the space between specific pairs of letters to improve visual harmony. For example, adjusting the space between the 'A' and 'V' so they sit better together.

ii. **Tracking** is the uniform spacing between all letters in a block of text. Adjusting tracking can help make your text more compact or spaced out, depending on the look you are going for.

Paragraph Spacing and Indentation

Paragraph Spacing: This controls the space before and after a paragraph. It helps separate blocks of text and gives the document a clean, organised look.

Indentation: Indenting the first line of a paragraph is common in books and long-form documents. It visually separates paragraphs and makes the text easier to follow.

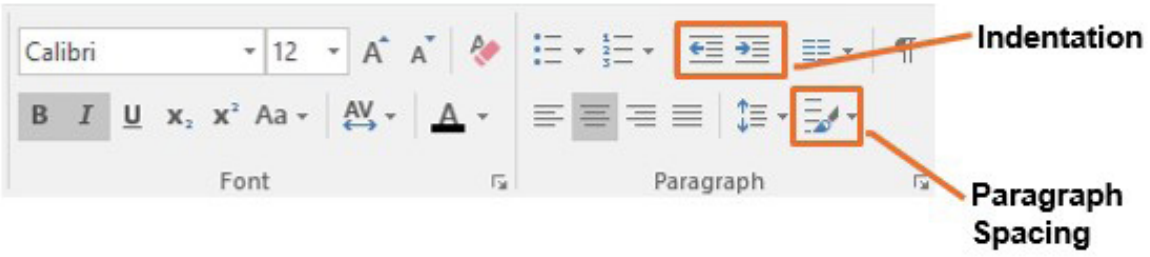


Figure 1.21: Indentation and Paragraph Spacing

Bullet Points and Numbering

Bullet points and numbered lists make information easier to scan and organise, helping the reader digest the content quickly. Desktop publishing software offers various styles of bullets and numbers to suit the document's design.



Figure 1.22: Bullet Points and Numbering

Text Colour

The colour of your text should match the overall design of your publication. You can change the colour to match your brand, event theme or simply to highlight important information.

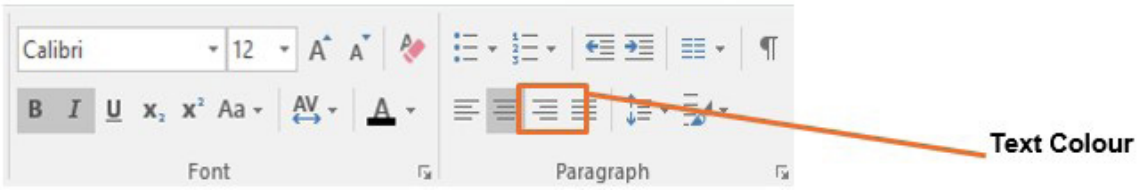


Figure 1.23: Text Colour

Graphic Tools in Desktop Publishing

One of the strengths of desktop publishing software is the integration of graphics. It allows you to easily insert, manipulate and enhance images to complement your text.

Table 1.16: Managing Images in Desktop Publishing

ACTION	DESCRIPTION
Inserting Images	You can easily add images from your computer or an online source to your publication, enhancing its visual appeal.
Manipulating Images	Resize, crop and rotate images to fit your layout, ensuring they align with your overall design and presentation goals.
Image Effects	Desktop publishing (DTP) software allows you to apply effects such as shadows, glows or opacity adjustments to images, adding more depth and style.
Integration with Graphic Design Software	Advanced tools like Adobe InDesign allow you to integrate images created in Adobe Illustrator or Photoshop, providing greater design flexibility.

Page Layout Tools

Page layout tools help you arrange text, images and other design elements on the page. These tools make it easier to align and position elements accurately.



Figure 1.24: Page layout Tools

Printing And Sharing The Document (WYSIWYG)

WYSIWYG stands for "What You See Is What You Get." This means that the design you create on your computer screen will look the same when printed or shared online.

a. Before printing, always check the print preview to make sure everything is in the correct place.

b. You can export your final design as a PDF, JPEG or other file formats, depending on your needs.

Typography Features: The Art Of Making Text Readable And Beautiful

Typography is not just about making text legible; it is about creating a design that communicates the right message through text styling.

Hierarchy

Hierarchy in typography refers to using different font sizes, weights and styles to show the importance of certain pieces of text. For example:

a. Headlines: These should be the most prominent.

b. Subheadings: These should be secondary, but still easy to spot.

c. Body Text: The main content should be easy to read but not overpower the headings.

Readability

Choose fonts that are easy on the eyes, especially for long blocks of text. Serif fonts (like Times New Roman) are great for printed documents, while sans-serif fonts (like Arial) are often used for digital content.

Legibility

Legibility is about ensuring that each character is distinct. Avoid decorative fonts for body text, as they may be hard to read at smaller sizes.

Contrast

The contrast between the text and the background is important for readability. For example, black text on a white background offers great contrast, making it easy to read. Avoid combinations like light grey text on a white background, as this can strain the eyes.

Consistency

A professional publication usually uses no more than two or three fonts. Keeping your fonts consistent makes your design look unified. Use the same heading styles and font sizes for similar elements throughout your document.

White Space

White space or negative space is the area around text and images that is left empty. White space improves readability, makes your content easier to navigate and highlights important information. A crowded page can overwhelm the reader.

Activity 1.15 Exploring Typography Principles

This activity will give you the skills you need to be able to create a design that communicates the right message through text styling.

Steps

1. Explain basic typography principles: font selection, spacing, line height and alignment.
2. Discuss how these elements affect readability and visual appeal in publications (e.g., brochures, posters).
3. Create a flyer for a school event using tools like font selection, alignment and line spacing and incorporate graphics such as images and shapes.
4. Share your flyer with the class. How did you apply typography to make the text readable and beautiful? How did you use graphic tools to enhance the flyer's design?

COLOUR MANAGEMENT FEATURES IN DESKTOP PUBLISHING

What is Colour Management?

Colour management in desktop publishing is about making sure the colours in your design look the same on different screens, printers, or devices. Different devices and materials interpret colours in different ways, so it is important to ensure consistency.

For example, a colour that looks bright blue on your computer screen may print out as a dark blue when you send it to the printer. With proper colour management, you can control these differences and make sure the final product looks exactly how you want it.

Understanding The Key Colour Models

There are three main colour models that are used in desktop publishing: RGB, CMYK and HSB/HSV. Each one is useful for different purposes, and it is important to know when to use each one.

RGB Colour Model (Additive Colour Model)

The RGB model is used for digital designs, such as what you see on your computer screen, TV or smartphone.

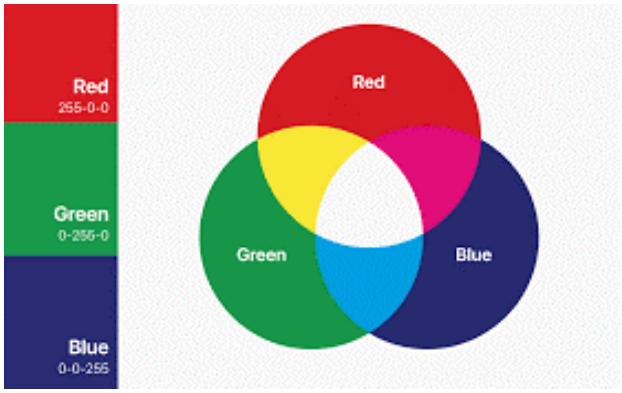


Figure 1.25: RGB Colour Model

How RGB Works

a. RGB stands for Red, Green and Blue. These are the three primary colours used in the RGB model.

b. The colours are created by mixing different intensities of red, green and blue light.

c. When all colours are combined, the result is white. When no colour is present, the result is black.

Example

- High intensity of red, green and blue light = white.
- Low intensity (zero light) of red, green and blue = black.

When to Use RGB: Use RGB when you are designing something that will be viewed on a screen, such as a website, email or digital flyer.

Activity 1.16 Exploring Colour Mixing with RGB

This activity will help you understand colour mixing using the RGB model and explore different colour models like RGB, CMYK, and HSB/HSV, focusing on their applications in digital and print media.

Steps

1. Explain what RGB stands for.
2. Explore the RGB Mixer link: RGB Mixer.
3. Explore the colour mixing tool by adjusting the sliders for Red, Green and Blue to create different colours.
4. Adjust sliders to create Cyan, Magenta and Yellow using the following RGB codes:
    a. RGB (0, 253, 253) (Cyan)
    b. RGB (255, 0, 255) (MAGENTA)
    c. RGB (255, 253, 5) (Yellow)
5. Take a screenshot on your device after creating each of the three colours: Cyan, Magenta and Yellow, using the specified RGB codes.
6. Compare the colours they created with the names: Cyan, Magenta, Yellow.
7. In your small groups, share your screenshots and compare the colours you created. Were the colours you created close to the expected ones? What might cause slight differences in the appearance of the colours on different screens or devices?

CMYK COLOUR MODEL (SUBTRACTIVE COLOUR MODEL)

The CMYK model is used for designs that will be printed. This includes things like flyers, brochures and posters.



Figure 1.26: CMYK Colour Model

How CMYK Works

1. **CMYK** stands for Cyan, Magenta, Yellow, and Key (Black). These are the four colours of ink that printers use to create all other colours.
2. Unlike RGB, which adds light, CMYK works by subtracting light.
3. When you print something, the colours on the page subtract the white light from the paper, making the ink visible.

Example: If you mix cyan, magenta and yellow inks, you should get black, but in reality, it produces a muddy dark brown, so black ink (Key) is added for a deeper, cleaner black.

When To Use CMYK

Use CMYK for anything that will be printed, such as flyers, magazines, business cards and posters.

HSB/HSV Colour Model (Hue, Saturation, Brightness)

The **HSB** or **HSV** colour model is used mainly by designers and artists to pick colours based on how humans perceive them.

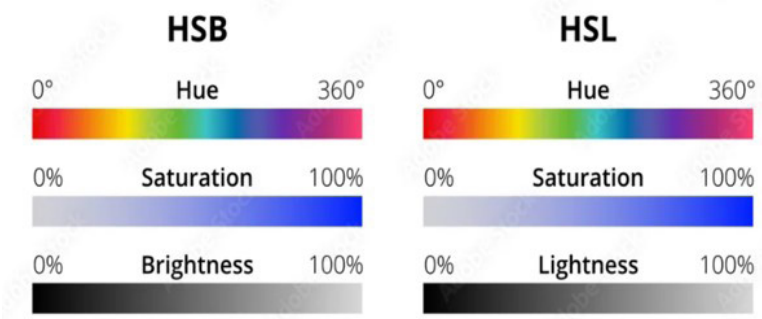


Figure 1.27: HSB/HSV Colour Model

How Hsb/Hsv Works

1. **Hue:** The actual colour itself, like red, blue or green.
2. **Saturation:** The intensity or vibrancy of the colour. A colour with high saturation is bright and pure, while a colour with low saturation looks faded or muted.
3. **Brightness:** How light or dark the colour is.

Example: If you want a bright red colour, you would set the hue to red, the saturation to high and adjust the brightness to get the shade you like.

When To Use Hsb/Hsv

Use **HSB/HSV** when you are creating colours for digital artwork, such as designing a logo or adjusting colours for an event poster.

Why Colour Consistency Is Important

Colour consistency ensures that your design looks great everywhere, whether it is on a screen or printed on paper. Here are a few reasons why it is essential to manage colours properly

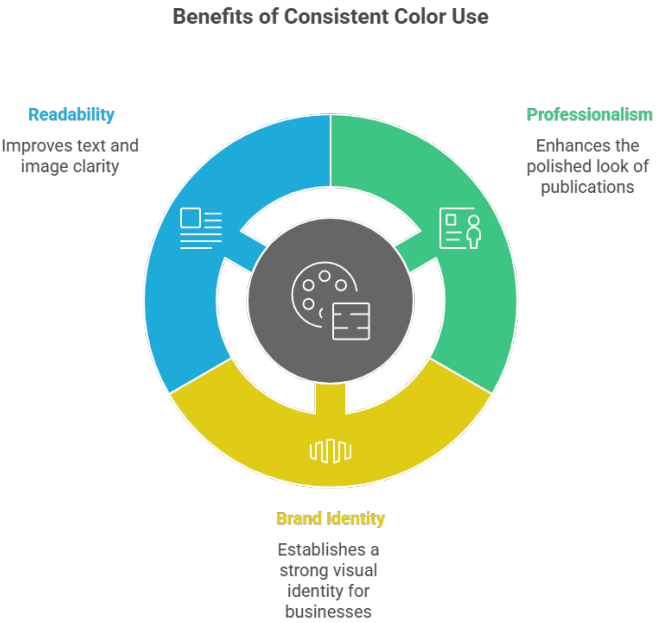


Figure 1.28: Benefits of Consistent Colour Use

Colour Harmonies And Colour Theory

In desktop publishing, knowing a bit about colour theory can help you choose the best colours for your design. Here are a few helpful colour harmonies:

a. **Complementary Colours:** Complementary colours are opposite each other on the colour wheel. For example, red and green. Using these together can create contrast and make your design pop.

b. **Analogous Colours:** Analogous colours are next to each other on the colour wheel, like blue, green and yellow. These colour work well together to create harmony in your design.

c. **Triadic Colour:** Triadic colours are evenly spaced on the colour wheel, such as red, yellow and blue. These colours give a balanced feel to your design.

Choosing The Right Colour For Your Audience

When choosing colour for your designs, always think about your audience and the message you want to send. For example, if you are designing a flyer for a funeral or memorial service, you might want to use a darker, muted colour like black or purple to show respect. On the other hand, for a wedding or a happy occasion, bright, pastel colours might be more suitable.

Activity 1.17 Designing a Cultural Day Poster for School

Let us create a poster for the Kumasi Wesley Girls' High School Cultural Day using the CMYK model, since it will be printed.

Steps

1. Choose a Template: Open Microsoft Publisher and select a Poster Template.
2. Set the Colour: Use red and gold as the primary colour for the event to symbolise strength and achievement.
3. Insert a Title: Use a bold font for the title: "Kumasi Wesley Girls' High School Cultural Day."
4. Use Cultural Symbols: Incorporate Adinkra symbols and Kente patterns to reflect Ghanaian culture.
5. Adjust Colour for Print: Convert any RGB colour to CMYK to ensure they look vibrant when printed.
6. Final Check: Make sure your colours are balanced, and your text is legible and easy to read.

SAVING AND SHARING YOUR WORK

Once you are happy with your design, it is time to save and share it.

1. Save Your File: Go to **File** > **Save As** and choose **PDF format** for sharing online or printing.
2. Print Your Poster: Check the print preview to make sure the colours look as expected, then print your design.

Activity 1.18 Identifying and Understanding Colour Models

In this activity, you are going to apply your knowledge and skills to explore different colour models and present.

Steps

1. Explain the RGB, CMYK and HSB/HSV colour models and their applications (example: RGB is used for digital screens (computers, phones) where colours are created by mixing red, green and blue light.
2. In your mixed groups, choose one of the colour models (RGB, CMYK, HSB/HSV). Research your chosen colour model and prepare a brief explanation (including its uses in digital or print media).
3. Provide examples of where their assigned colour model is used (e.g., RGB for web design, CMYK for print publications).
4. Present your findings to the class, explaining the model, its applications and any differences between the models.
5. Reflect on the peer feedback on the presentation.

Working with Text Boxes

Text boxes are containers for text that can be positioned anywhere on your page. Text boxes help you organise your text in a clean and structured way, making your document easy to read.

Inserting and Using Text Boxes: To insert a text box in Microsoft Publisher

a. Go to the Insert tab on the Ribbon.
b. Click on the Text Box option.
c. Click and drag your cursor on the page to create the text box.
d. Type or paste the content you want into the text box.

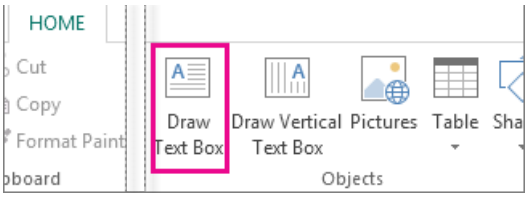


Figure 1.29: Text Box

Positioning and Resizing Text Boxes

a. You can move the text box by clicking on it and dragging it to your desired location on the page.

b. Resize the text box by dragging the corners to adjust the size.

Formatting Text Within Text Boxes: Once your text is in the box, you can adjust

a. Font style and size: Make headings bold and larger to grab attention.

b. Text colour: Change the colour of text to match the design.

c. Text alignment: Align the text to the left, centre or right, depending on how you want it to appear.

Using Tables in Desktop Publishing

Tables are an excellent way to organise and present information in a structured format. You can use tables for things like schedules, prices or lists.

Inserting Tables: To insert a table in Microsoft Publisher

a. Go to the Insert tab and click on the Table option.

b. Select the number of rows and columns you need or draw a custom table.

c. Fill in the content for each cell of the table.

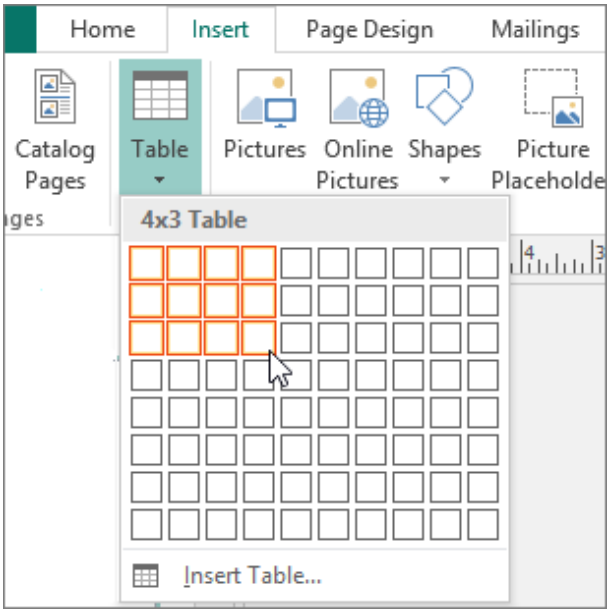


Figure 1.30: Inserting Tables

Formatting Tables

Once the table is inserted, you can format it by adjusting

a. Column widths: Resize columns for better alignment and readability.

b. Row heights: Adjust row heights to make sure your text fits neatly.

c. Borders and shading: Add borders around the table or colour certain rows or columns to highlight important information.

When to Use Tables

Tables are great for presenting data in a clear and organised way. For example, if you are designing a flyer for a school event, you might use a table to list the event schedule, such as times and activities.

Adding Pictures to Your Publication

Pictures help to make your publication more visually engaging. Whether you are designing a flyer for an event or a brochure, images are an important tool for communicating your message.

Inserting and Resizing Pictures: To insert a picture in Microsoft Publisher

1. Go to the Insert tab and click on Picture.
2. Select an image from your computer or from an online source.
3. Resize the image by clicking and dragging the corners.

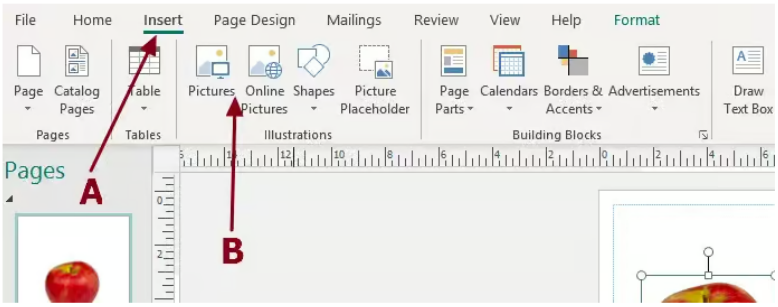


Figure 1.31: Inserting Picture

Picture Positioning and Text Wrapping

After inserting the image, you can adjust its position on the page. You can move the picture and use text wrapping to ensure the text flows around the image. This is especially useful for designing brochures or event posters.

Formatting Pictures with Picture Frames

a. You can add a frame around the image to make it stand out. Use different frame styles such as a solid border, dashed line or shadow effect.

b. Frames help create a professional look and emphasise the image in your design.

Using Word Art

Word Art is a tool that allows you to add stylised and decorative text to your publication. You can use it to create attention-grabbing titles or highlights.

To insert Word Art

1. Go to the Insert tab and click on Word Art.
2. Choose a style from the available options.
3. Type in your desired text, such as the title of your event or an important message.

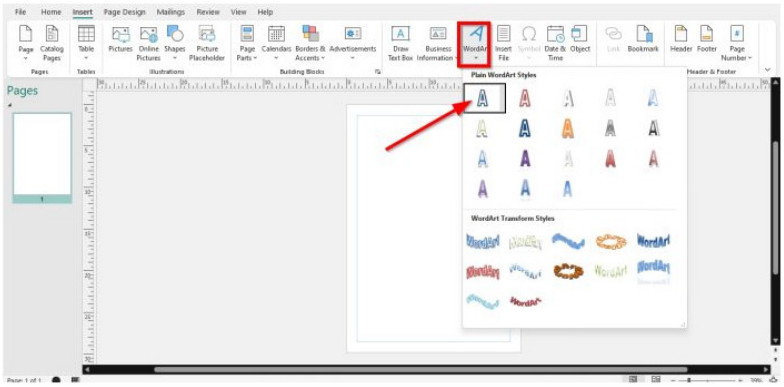


Figure 1.32: Inserting WordArt

Formatting Word Art

Once your Word Art is inserted, you can

a. Change the font style.

b. Adjust the colour of the text.

c. Add effects like shadows or glows to make it stand out.

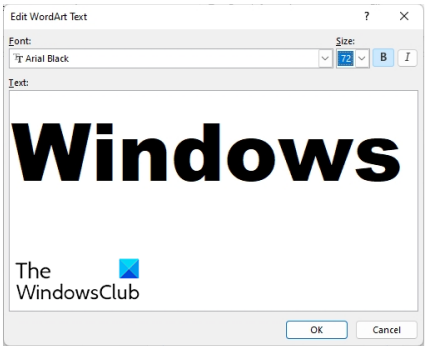


Figure 1.33: Formatting WordArt

When to Use Word Art

Use Word Art for creating titles or headlines that need to grab attention. For example, in a flyer for a school cultural day, you might use Word Art to create an exciting, bold title like “Kumasi Wesley Girls’ High School SHS Cultural Day 2025”.

Exporting and Saving Your Publication

Once you have created your publication, you will want to save and export it so you can share it or print it.

Saving Your Publication

1. To save your work, go to the File tab and click on Save As. Choose where you want to save your document (e.g., on your computer or cloud storage like Google Drive).
2. You can save your publication in various formats:
   a. **.pub** (Publisher format) if you want to keep editing it later.
   b. **.pdf** (Portable Document Format) for sharing and printing.
   c. **.jpeg** or **.png** for images.

Exporting Your Publication

1. If you need to share your document with others, exporting as a PDF is a good choice. PDF files are easy to share via email or on websites and maintain the quality of your design across different devices and platforms.
2. To export, go to the File tab, click Export and select Create PDF/XPS Document.

Printing Your Publication

1. Before printing, always check the print preview to ensure that your design looks correct.
2. Once satisfied, click Print to send the publication to your printer. Make sure your printer is set up correctly and that you have enough paper and ink.

Activity 1.19 Designing a School Event Flyer

This activity will help you create a flyer for a school event using text boxes, tables, pictures and Word Art.

1. Open Microsoft Publisher and choose a Flyer Template.
2. Add a Title: Use Word Art for the title, for example, “Sawla Senior High School Science Fair 2025.”
3. Insert Event Details
   a. Use text boxes to add the date, time and location.
   b. Create a table to list the schedule of events.
4. Insert an Image: Add a picture related to science or the event.
5. Add a Table: Insert a table with times for different activities at the event.

6. Adjust Layout and Formatting: Ensure everything is properly aligned and that there is enough spacing between sections.
7. Save and Export: Save your flyer as a PDF file for sharing and printing.
8. Present your work to the class for peer review.
9. Reflect on the presentation feedback.

Exploring Word Art, Picture Frames, Alignment and Distribution

1. **Using Word Art**

Word Art is a powerful tool in desktop publishing software that allows you to turn simple text into something eye-catching and decorative. Word Art is especially useful for creating titles, headings and emphasis on important text.

a. Inserting Word Art



Figure 1.34: Inserting WordArt

b. Formatting Word Art

i. Once you have inserted the Word Art, you can format it by

- Changing the font or text colour.
- Applying effects like shadows, glows or 3D effects to make it stand out.
- Adjusting the size of the text to make it more prominent.

c. When to Use Word Art

i. Word Art is best used for titles, headings or important messages in your document. For example, in a school event flyer, you might use Word Art to create a title like “Kumasi Wesley Girls’ High School Talent Show 2025”.

2. **Adding and Formatting Picture Frames**

Pictures are a great way to add visual appeal to your publications. A picture frame adds a decorative border around your images, which helps them stand out and integrates them into your design.

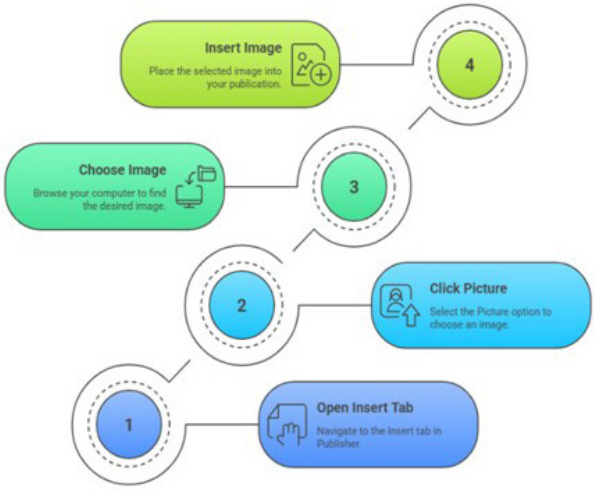


Figure 1.35: Inserting a picture in Publisher

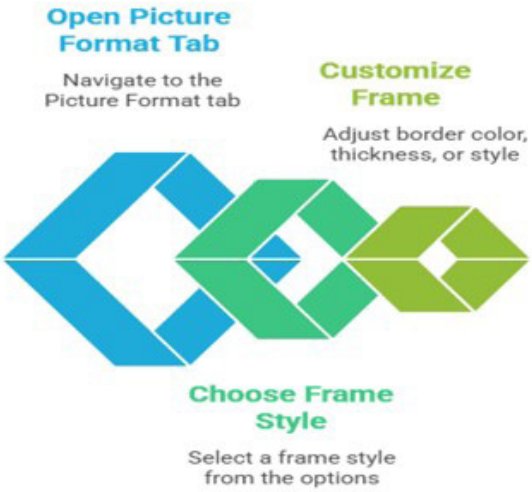


Figure 1.36: Adding a Frame to an Image

a. **Why Use Picture Frames**

Picture frames help to:

- Emphasise the image.
- Create a professional look.
- Organise your publication by framing images within specific sections.

b. **Cultural Consideration:** In Ghanaian publications, especially for cultural events, you may use traditional patterns or colours like Kente designs as a picture frame to reflect Ghanaian identity.

3. **Aligning Objects in Your Publication**

Alignment ensures that your text, images and other elements are neatly arranged and easy for the reader to follow. Proper alignment makes your publication look organised and balanced.

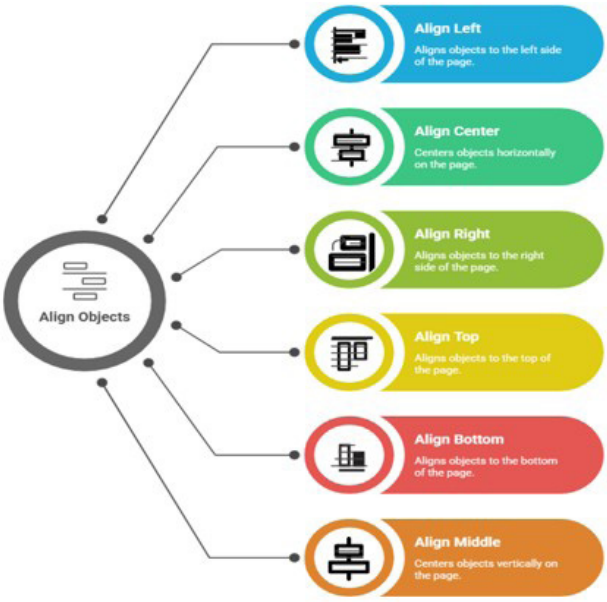


Figure 1.37: Exploring Alignment Options in Publisher

a. How to Align Object

b. Why Alignment is Important: Aligning objects helps make your publication look neat and professional. It also helps to create a clear flow for the reader, guiding their eyes from top to bottom or left to right.

4. **Distributing Objects Evenly**

Distributing objects evenly ensures that there is consistent space between items, which helps to create a well-organised and balanced design.

a. **How to Distribute Objects:** To distribute objects in Microsoft Publisher:

   i. Select all the objects you want to distribute by holding down the Shift key and clicking on each object.

   ii. Go to the Home tab and click on Align.

   iii. Choose Distribute Horizontally (to space the objects evenly from left to right) or Distribute Vertically (to space the objects evenly from top to bottom).

b. **When to Use Distribution:** Use the distribution tool when you have multiple objects, like text boxes or pictures, and you want them to be evenly spaced on the page. This ensures a clean, organised layout.

Example: For a school event poster, you might have several pictures or text boxes for different activities. Use distribution to space them evenly on the page, creating a neat and balanced design.

Activity 1.20 Designing a School Event Poster

This activity will help you use Word Art, picture frames, alignment and distribution to design a poster.

Steps

1. Insert Word Art: Add the title "Sawla Senior High School Sports Day 2025" using Word Art. Use a bold font with a shadow effect to make the title stand out.
2. Insert Pictures: Add images related to sports, like athletes running or students playing football. Apply picture frames around the images to emphasise them and give them a polished look.
3. Insert Event Details: Use text boxes to add event details like the date, time and venue. Align the text boxes so that the date is aligned to the top, the time and venue are aligned below it.
4. Align and Distribute Objects: Align the text boxes to the centre and distribute the images evenly on the page to create a balanced design.
5. Final Touches: Ensure the overall layout is clean and easy to read, with enough spacing between each element.
6. Save and Export: Once the design is complete, save your work as a PDF for printing or sharing digitally.
7. Present your work to the class for peer review.
8. Reflect on the presentation feedback.

USING BASIC TOOLS IN DESKTOP PUBLISHING (DTP)

1. Layering and Stacking Order

Layering in desktop publishing (DTP) refers to the technique of arranging different elements (such as text, images, graphics and shapes) on separate layers in a design. Each layer can be edited individually, allowing for better organisation and flexibility during the design process. When we add many objects (like pictures and text boxes) in a publication, they can overlap or cover each other. Layering helps you decide which object should appear in front of or behind.

Stacking order refers to the layered arrangement of objects (such as text, images, shapes, or graphics) in desktop publishing software, determining which objects appear in front or behind others.

Examples

a. If a picture is covering your text, you can send the picture to the back.

b. If you want a heading to stand out, you can bring it to the front.

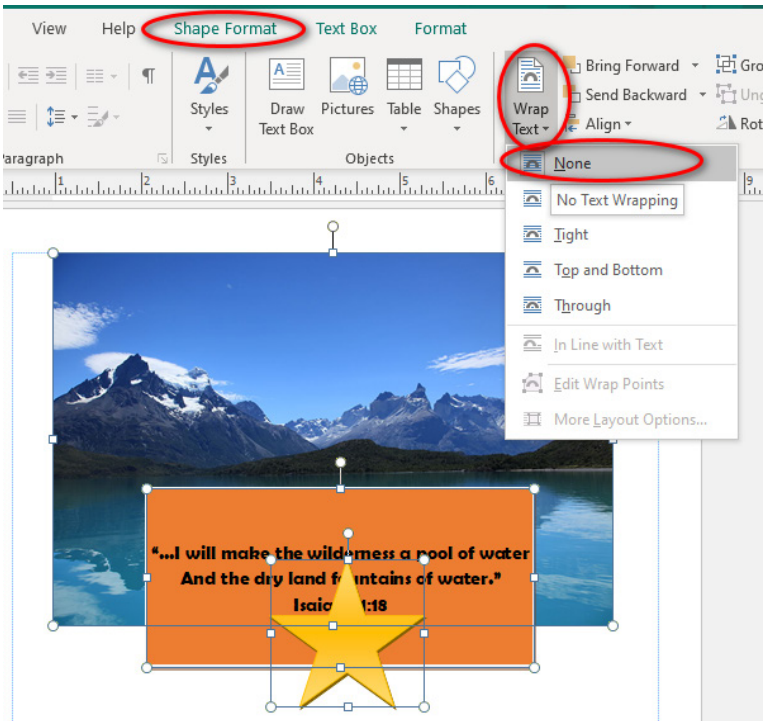


Figure 1.38: Layering

Common Layering Tools

1. Bring to Front – puts the object on top
2. Send to Back – moves the object behind all others
3. Bring Forward – moves the object one step up
4. Send Backwards – moves the object one step down

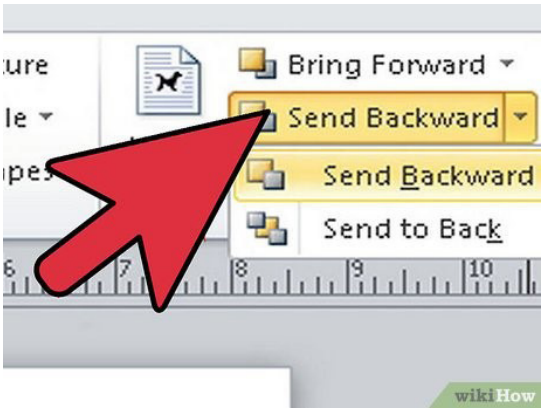


Figure 1.39: Layering Tools

Try adding three shapes or pictures. Use the layering tools to change which one is on top.

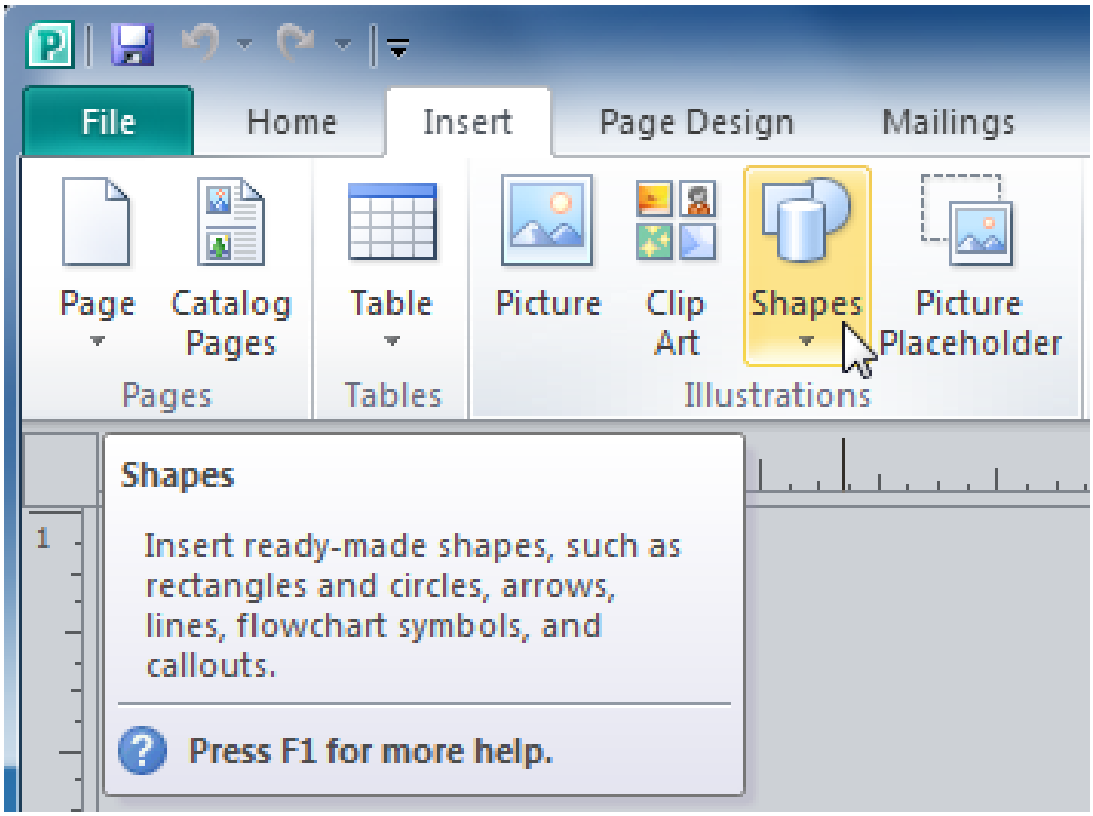


Figure 1.40: Adding Shapes

2. Grouping and Ungrouping Objects

Grouping means combining several objects so that you can move or resize them as one item.

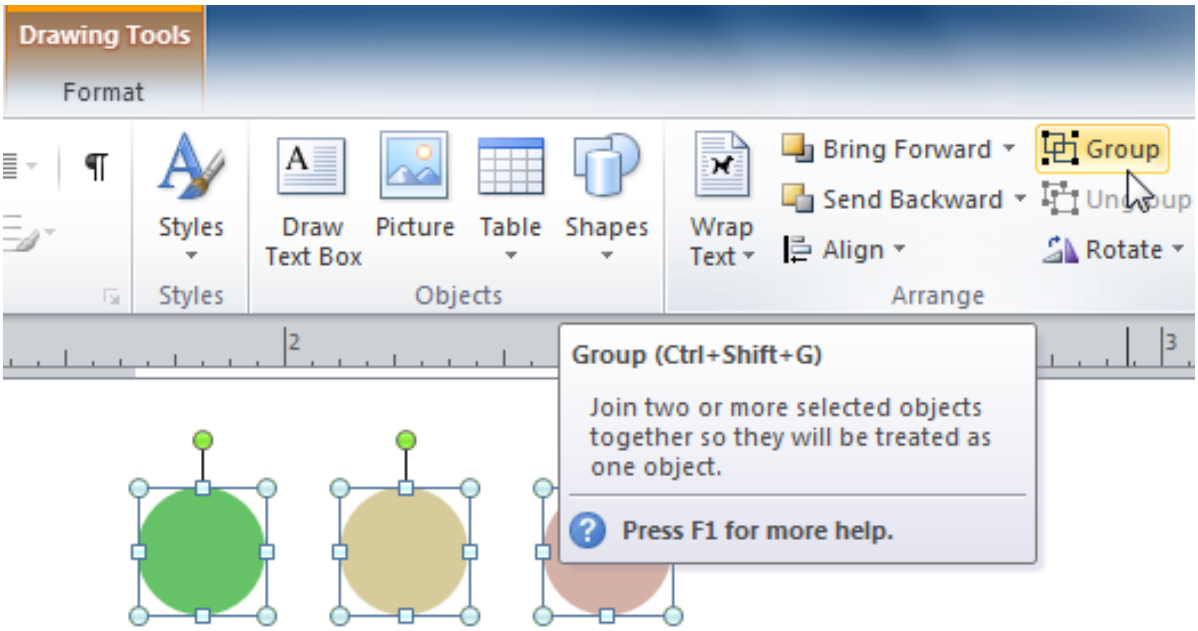


Figure 1.41: Grouping Objects

Ungrouping means separating them again to edit each one individually.

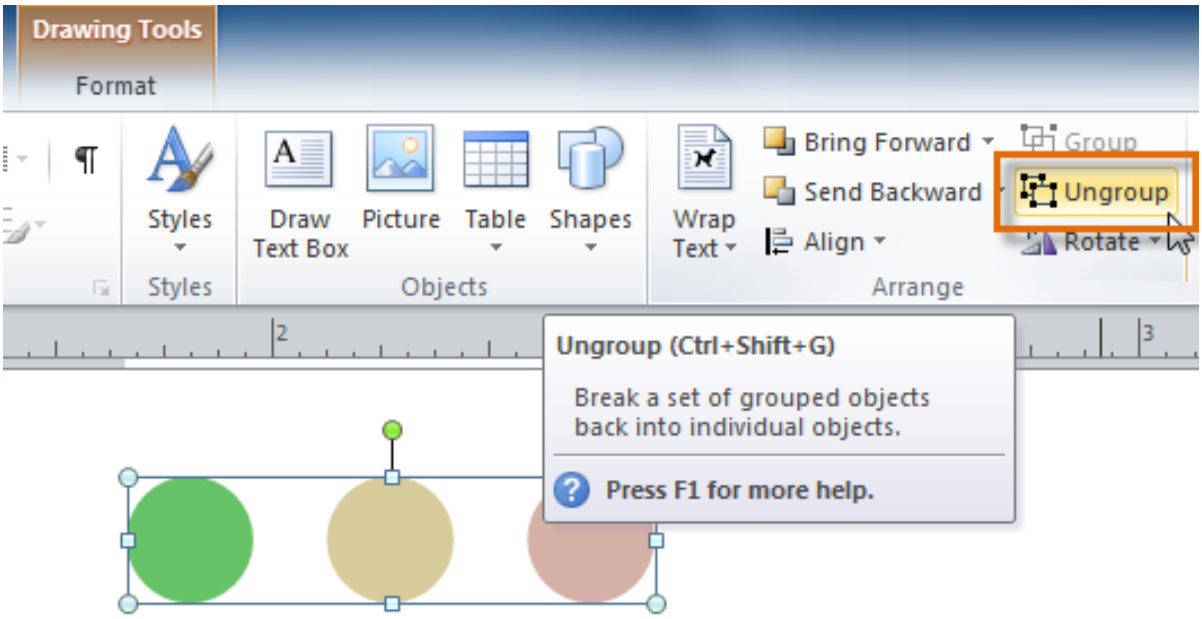


Figure 1.42: Ungrouping Objects

Why Group?

1. To move objects together
2. To apply the same style or format to all
3. To keep your layout organised

Activity 1.21 Grouping and Ungrouping Objects

To be able to group and ungroup objects in DTP, this activity will help you

Steps

1. Insert a picture, a caption (text box) and a border (shape).
2. Group them.
3. Move them around the page as a single object.
4. Then ungroup and change only the caption.
5. Present your work for discussion with the class.
6. Reflect on the presentation feedback.

3. Using Alignment and Smart Guides

Alignment tools help you arrange your objects neatly so that everything looks organised and professional.

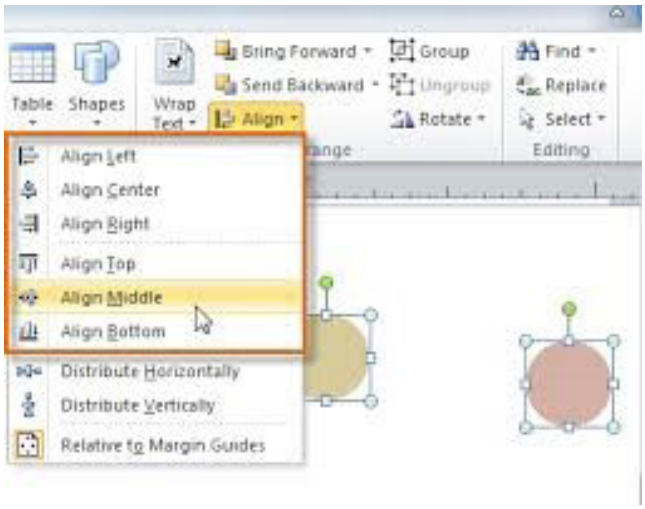


Figure 1.43: Alignment Guides

Smart guides are dotted lines or highlighted snap points that appear when you are moving an object close to others or to the edge of the page.

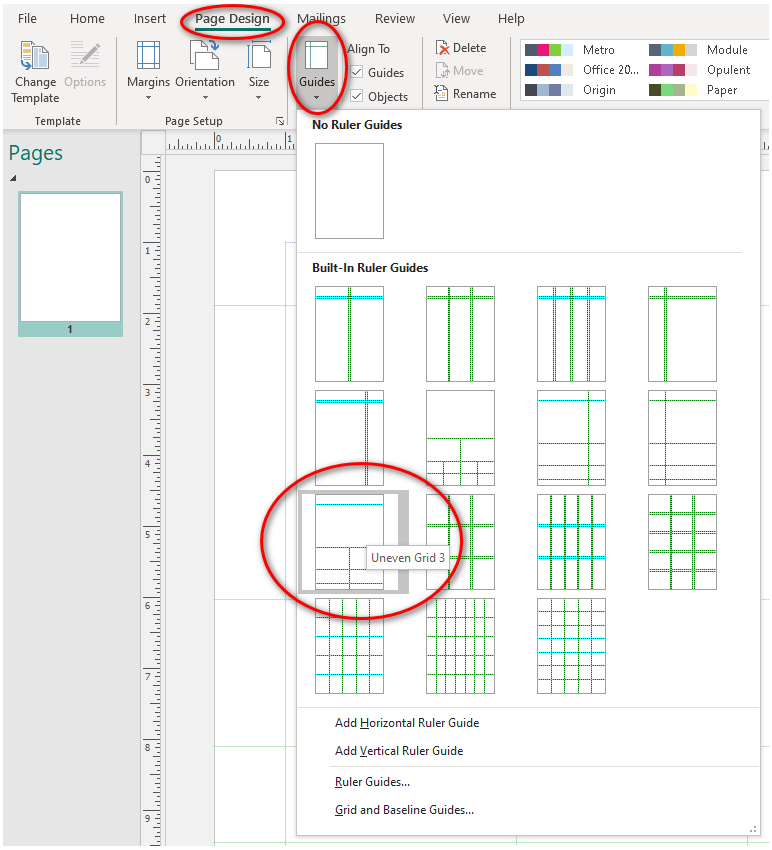


Figure 1.44: Smart Guides

How to Use Alignment Guides

1. Turn on ‘Guides’ or ‘Gridlines from the View menu in your software.
2. Move your objects until they snap into place with the lines.
3. Use the Align menu to centre objects or space them evenly.

Activity 1.22 Alignment and Smart Guide

In continuation of your previously saved works

1. Open a new template
2. Add three pictures.
3. Use alignment guides to line them up side by side.
4. Add a heading and centre it using alignment tools.

EXTENDED READING

- https://tutsplus.com/tutorials/how-to-add-transitions-in-powerpoint



- https://www.techwalla.com/articles/how-to-use-animations-in-powerpoint



- https://sites.google.com/rcisd.org/c4lhelp/google/google-slides



- https://edu.gcfglobal.org/en/powerpoint/working-with-tables/1/



- https://edu.gcfglobal.org/en/powerpoint/working-with-charts/1/



- https://edu.gcfglobal.org/en/powerpoint/working-with-hyperlinks/1/



REVIEW QUESTIONS

1. How would you apply an animation effect to text in PowerPoint to make it appear when you click on the slide?
2. What is the difference between a fade transition and a push transition in PowerPoint? When would you use each one?
3. How do animations and transitions work together to improve the flow of a presentation? Provide an example of when both should be used together effectively.
4. Given a set of data, how would you choose an appropriate transition or animation effect to highlight important information and engage the audience?
5. Describe how you can add and format a table in Google Slides/PowerPoint to organise information effectively in your presentation
6. How would you collaborate with a team on a Google Slides/PowerPoint presentation? What steps would you take to ensure your presentation is solid and visually appealing?
7. Given a set of data in a spreadsheet, how would you present the data clearly and engagingly? Explain your choice of chart or graph.
8. Classify these views into
   - **A.** Editing category
   - **B.** Presenting category

   Slide Sorter View, Slide Show View, Normal View.
9. Compare a readable font (like Arial) and a decorative font (like Curlz MT). Which one is better for presentations and why?
10. Organise a list of steps you will take to make a presentation accessible to everyone, including people with disabilities.
11. Create a checklist for your group to use when reviewing a presentation to ensure it meets accessibility standards
12. How can you format a table in PowerPoint to make it visually appealing and easy to read?
13. You are given a dataset in PowerPoint that shows sales data for different months. How would you create a line graph to display this data and explain your choice of this chart type?
14. Describe how to choose the best table format to display a schedule and explain why certain formatting choices are more effective in organising the information?
15. Explain how interactivity in a website makes it more engaging for users. What are some common interactive elements found on websites?

REVIEW QUESTIONS

16. Why is it important to use hyperlinks in educational apps or websites and how do they improve the overall learning experience?
17. How can you format a bar chart to make it clearer and more visually appealing for an audience? What are the key elements to focus on while formatting?
18. You are presenting data on student performance across different subjects. How would you choose between using a pie chart, a bar chart or a line graph and what are the reasons for your choice?

SECTION

2

DIGITAL TOOLS & SOCIAL MEDIA



ICTS In The Society

Emerging Technologies And Applications

INTRODUCTION

Get ready to explore the exciting world of digital tools that are transforming the way we communicate and collaborate. In the previous section, you learned the basics of desktop publishing, using tools like Microsoft Word and Excel to organise and present information. Now, it is time to build on those skills and dive into more dynamic tools for communication and collaboration.

In this section, you will analyse how social media platforms like Facebook, Twitter, Instagram, LinkedIn and YouTube have changed the way we connect with others. You will also learn how to use synchronous tools like Zoom and Google Meet for real-time communication and asynchronous tools like email and instant messaging for flexible, time-shifted interactions. Whether it is for school, work or personal use, this section will equip you with the skills to use these tools effectively and professionally. Get ready to take your communication skills to the next level.

KEY IDEAS

- **Affordances of Digital Tools:** What digital tools enable users to do (e.g., quick access to information, real-time communication, creative expression, automation of tasks).
- **Impact of digital tools:** For example, on education, business, entertainment, health, etc.
- **Positive and Negative Effects:** Benefits (efficiency, access, connectivity) and challenges (overdependence, distraction, digital divide).
- **Risks and Challenges of social media:** Misinformation, cyberbullying, privacy issues and addiction.
- **Understanding Digital Tools:** Definition and examples (e.g., smartphones, computers, software, apps, digital cameras, etc.).
- **Social media and its uses:** Definition, examples (Facebook, Instagram, etc), uses (Sharing information, connecting with others, promoting ideas or businesses, and learning.
- **What is social media:** Definition and examples (Facebook, Twitter/X, Instagram, LinkedIn, YouTube, etc.).

EVERYDAY IMPACT OF DIGITAL DEVICES

Activity 2.1 Exploring the Everyday Impact of Digital Devices

This activity will help you revisit and reinforce your knowledge on the purpose and uses of digital devices.

1. To recall the purpose and uses of the following devices listed below, form a group of 3 or 4. First write your answers into
   a. Smartphones,
   b. Digital Cameras,
   c. Wearable Devices,
   d. Game Devices,
   e. E-Book Readers,
   f. Portable/Digital Media Players,

   Note: Record your responses
2. Compare and discuss your answers with a colleague about how these devices are used in communication, entertainment, education and personal development.
3. Still in your groups, you will receive cards from your teacher. The first set of cards with the names of the devices (e.g., Smartphone) and a second set with case scenarios (e.g., "Watching movies on the go,")
   a. Match the devices to their case scenarios. For example, a Smartphone might be matched to "Communication through calls and messages".
   b. Discuss the affordances of each device: what makes each device suitable for its use case.
4. Each group will then choose one device (from the list in point 1 above) and create a short (3-5 minutes) multimedia presentation.

   Hint: Alternatively, where there are no computers, use flip chart papers and markers, poster paper displays and cardboard models.
5. Reflect on the presentations and have a discussion on the following:

Reflection Questions	Learner Responses
Which device do you find most useful in your daily life and why?	
How has technology, specifically these devices, improved communication or learning for you?	

INTRODUCTION TO DIGITAL TOOLS

Digital tools are tools, software or applications that help us communicate, create, learn and work more efficiently. These tools include mobile apps, software programs and online platforms. Some digital tools require an internet connection, while others can be used offline.



Figure 2.1: Exploring Digital Tools

Common Examples of Digital Tools

1. Google Classroom: Used in many schools for assignments and virtual learning.
2. Zoom/Google Meet: Commonly used for virtual meetings and online classes.
3. WhatsApp: A widely used instant messaging app in Ghana (and in many other countries) for both personal and academic communication.
4. Microsoft Word & Google Docs: Used for document creation and collaboration.

Digital tools have transformed how we study, work, communicate and entertain ourselves. These tools help us connect with others and access information easily.

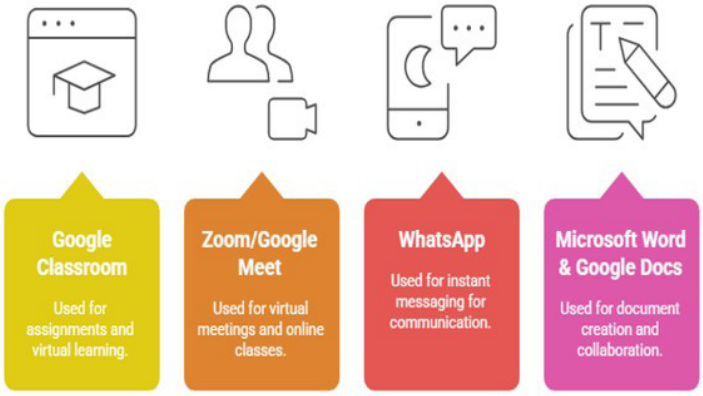


Figure 2.2: Digital Tools

Affordances of Digital Tools

The term affordance refers to the possibilities or functions a tool offers based on its design and features. Digital tools provide many affordances that help us achieve specific goals.

Examples of Affordances

a. Communication Tools (like WhatsApp and Zoom) afford instant communication, enabling people to connect globally and exchange ideas in real time. These tools help you stay connected with classmates and teachers, especially in remote learning situations in Ghana.



Figure 2.3: Examples of Affordances

b. Creative Tools (like Canva and Adobe Photoshop) afford the ability to design and create visual content such as flyers, posters or social media posts. These tools help learners express their creativity for school projects or personal branding.



Figure 2.4: Examples of Affordances

c. Productivity Tools (like Google Docs and Microsoft Word) afford collaboration by allowing multiple users to work on the same document at the same time. For example, learners working on group assignments can use Google Docs to edit documents together from different locations.

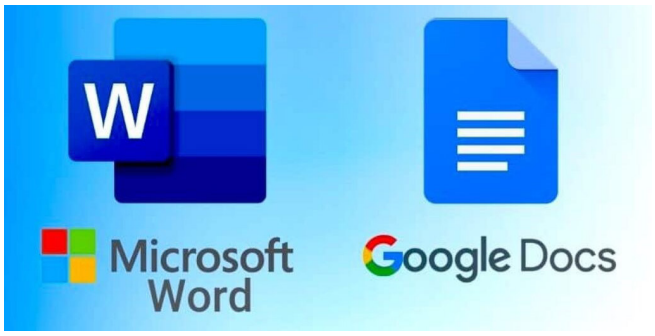


Figure 2.5: Examples of Affordances

These affordances help you work more efficiently, create in new ways and collaborate with others. They give us the power to do tasks that were once difficult or time-consuming.

Impact on Communication and Social Interaction

Digital tools have greatly changed how we communicate and interact with others. Social media platforms like Facebook, Instagram, WhatsApp and Twitter(X) allow people to connect with each other across distances, share ideas and stay updated on what is happening in the world.

Positive Impacts on Communication

a. **Instant communication:** With tools like WhatsApp or Facebook Messenger, you can instantly send messages, voice notes or make video calls to anyone, anywhere in the world.

b. **Global reach:** Social media platforms make it easy to share information with a global audience. For example, a learner in Ghana can share an academic achievement or an important message about school events with peers across the country.

c. **New forms of interaction:** Platforms like Instagram stories or Snapchat let users share quick updates and interact through images, videos and live feeds, helping people stay connected in creative ways.

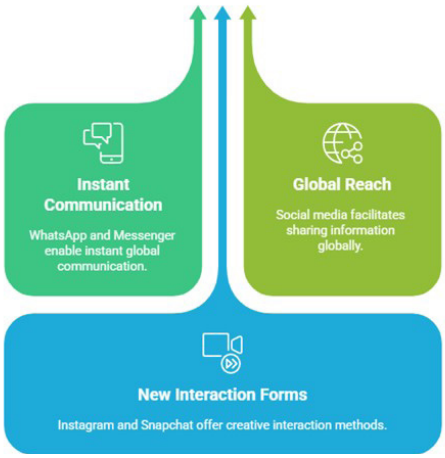


Figure 2.6: Digital Tools for Global Connections

Impact on Creativity and Expression

Digital tools have opened up new opportunities for creativity and self-expression. Tools like Canva, Adobe Photoshop and TikTok allow learners to express their creativity through designs, videos and art.

Impact On Creativity

a. **Personalised Content:** You can use Instagram or TikTok to showcase your creative projects or hobbies, reaching a large audience and possibly building your personal brand.

b. **Digital Art:** With tools like Canva or Adobe Photoshop, artists can create stunning artwork digitally, which can be shared with others or used for professional purposes.

c. **Collaboration:** learners from different parts of Ghana or the world can collaborate on projects using Google Docs, Canva or even TikTok, creating content together, such as a group project or video.

Impact on Entertainment and Media

Digital tools have transformed how we consume entertainment and media. Streaming platforms like Netflix, Spotify and YouTube provide on-demand access to movies, music, TV shows and podcasts. Examples:

a. **Access to a wide range of content:** With platforms like YouTube or Spotify, you can watch movies, listen to music and access a vast library of entertainment whenever you want.

b. **Streaming platforms:** Services like Spotify and YouTube have made it easier for people in Ghana to discover new music, watch videos and enjoy entertainment content.

c. **User-generated content:** YouTube and TikTok allow users to create their own videos, music and creative content, making it easy for anyone to become a content creator.

Table 2.1: Impact, Challenges and Solutions of Digital Tools

Impact	Challenges	Solution
Improved communication and global connectivity.	Privacy and security concerns due to data collection and cyberattacks.	Use strong passwords, adjust privacy settings and be cautious when sharing personal information.
Increased access to information, learning and collaboration.	Cyberbullying and online harassment due to anonymity.	Report harmful behaviour, block abusive users and practice digital empathy.
Enhanced creativity through digital tools for art, music and writing.	Misinformation and fake news spreading rapidly on social media.	Always fact-check information from reliable sources and avoid spreading unverified news.

Entertainment and media consumption has become more accessible.	Overuse and addiction to digital tools, leading to mental health issues.	Set time limits for screen use, engage in regular digital detoxes and prioritise offline activities.
Digital tools allow real-time communication for collaboration and learning.	Information overload due to excessive notifications and constant updates.	Turn off unnecessary notifications, prioritise tasks and manage digital consumption.
Social media allows for advocacy and community-building opportunities.	Digital divide: lack of access to technology for some communities.	Promote digital inclusion by providing access to technology and training in underserved areas.
Access to educational tools, career development and professional networking.	Ethical issues like copyright violations and data misuse.	Follow legal guidelines for digital content sharing, respect copyrights and be aware of privacy laws.

Activity 2.2 Digital Tools in My Daily Life

In this activity, you will explore and understand the use of digital tools in the domains of communication, creativity and entertainment and how they impact people's daily lives.

1. Partner with a friend and discuss digital tools, like WhatsApp, Google Docs and any other that comes to mind.
2. With your partner, select one domain: communication, creativity or entertainment and then identify 2 to 3 digital tools used in that domain.
3. Discuss your affordances (the functions or features of the tool) and the impact these tools have on your interactions, creations or media consumption. Fill out the table below as you reflect on the discussions you have had.

Digital Tool	What Can the Tool Do?	Impact on Communication, Creativity, or Entertainment
WhatsApp		
YouTube		
Spotify		
TikTok		
Zoom		
Google Docs		

INTRODUCTION TO SOCIAL MEDIA PLATFORMS

In this section, you will explore popular social media platforms that people use every day. Each platform has its own unique features, target audience and primary use cases. Here is a quick overview.



Figure 2.7: Social Media Platforms

Table 2.2: Key Features of Social Media Platforms

S/N	Platform	Key Features	Target Audience	Primary Use Case
1	**Facebook**	Posts, stories, groups, events, Messenger	General public, older teens and adults	Social networking, group interaction
2	**Twitter (X)**	Tweets, retweets, threads, hashtags	Professionals, journalists, youth	Microblogging, trending news, debates
3	**Instagram**	Photo/video posts, reels, stories	Teenagers, content creators	Visual storytelling, branding
4	**LinkedIn**	Profiles, endorsements, job listings	Professionals, graduates	Career networking, recruitment
5	**YouTube**	Videos, playlists, comments	All demographics	Video content sharing, education, and entertainment
6	**Snapchat**	Disappearing messages, filters, streaks	Teens and young adults	Quick, fun messaging
7	**TikTok**	Short videos, effects, duets	Teens and young adults	Entertainment, trends, music videos

Communication and Networking on Social Media

Social media is not just about sharing content; it also allows real-time communication and global networking. These features enable interactions between people from different backgrounds and locations.

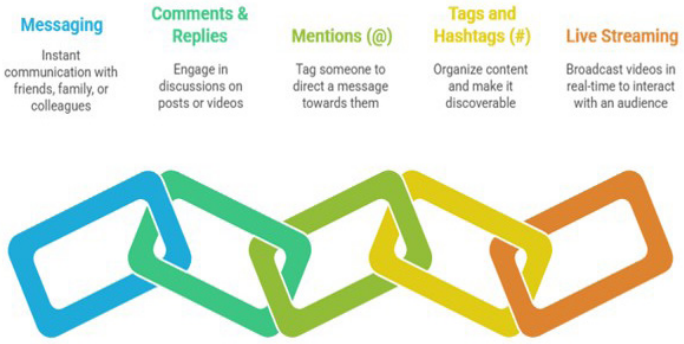


Figure 2.8: Social Media Interaction Features

How Social Media Connects People



Figure 2.9: Social Media Connections

Information Sharing and Dissemination

Social media has revolutionised the way we share and receive information. People use social media platforms to distribute content, making it accessible to a wide audience instantly.

Table 2.3: Types of Information Shared

TYPE OF INFORMATION	DESCRIPTION	PLATFORMS	PURPOSE/USE
News Updates	Platforms like Twitter (X) are widely used to share breaking news. It allows users to quickly disseminate information about ongoing events.	Twitter (X)	Real-time news dissemination and updates on ongoing events.

Educational Content	YouTube and Facebook provide educational videos, tutorials and discussions, making learning more accessible.	YouTube, Facebook	Sharing knowledge, tutorials and educational materials.
Announcements and Campaigns	Platforms like Facebook and LinkedIn allow businesses, organisations and individuals to announce events, job openings or social causes.	Facebook, LinkedIn	Announcing events, job opportunities and promoting social causes.
Real-Time Events and Live Coverage	Social media provides real-time updates during events like sports, concerts or political debates, keeping people informed as events unfold.	Facebook, Twitter (X), Instagram	Real-time event coverage and updates during live events.

Benefits of Information Sharing

1. **Fast and Broad Reach:** Social media allows information to spread rapidly across the globe, reaching millions in seconds.
2. **Interactive and Engaging Content:** Social media encourages engagement through likes, comments, shares and reactions. This creates a dynamic space for people to share their thoughts.
3. **User-Generated Content:** Social media empowers users to create and share content. This gives everyone a voice and the ability to contribute diverse perspectives.

Activity 2.3 Match the Platform to the Purpose

This activity will help you understand how to choose the most appropriate social media platform based on different use cases.

1. Organise yourself into a group of 3 to 4 members, discuss what "use cases" are (Real-world purposes for using social media platforms)
2. Describe some common platforms like Facebook, Instagram, etc.
3. With your handouts containing Use-cases: "Finding a job", "Watching tutorials", etc., discuss each use-case and decide which platform is most suitable for that particular purpose.
4. Each group works together to match the use cases with the most appropriate social media platform and record your responses.
5. Present your matched use cases to the class and explain why you selected that platform for the use case.

6. Reflect on what you learned about matching social media platforms to specific use cases? Why is it important to use the right platform for the right purpose?

S/N	USE-CASE	POSSIBLE PLATFORM	JUSTIFICATION
1	Finding a job		
2	Watching Tutorials		
3	Posting daily photos		

COMMUNITY BUILDING AND ENGAGEMENT

Social media platforms are designed to connect people. They help us engage with others who share similar interests, experiences and goals. Community building on social media refers to creating and fostering groups or networks that support and interact with one another.

Key Aspects of Community Building

a. **Interest-Based Groups:** Social media allows users to join or create groups based on shared interests. Platforms like Facebook offer groups for almost every hobby, profession or cause. Whether it is a group for photography enthusiasts, fitness groups or advocacy movements, these communities provide a space for people to connect, share ideas and learn from one another.

b. **Active Engagement:** Engagement on social media is not limited to passive consumption of content. It encourages active participation such as commenting, liking, sharing or creating content. For example, on Instagram and TikTok, users share personal experiences or thoughts that often spark conversations and help build a sense of belonging.

c. **Supportive Communities:** Online communities provide emotional and practical support. Mental health forums, parenting groups and self-improvement communities can offer advice, emotional support and a space to share personal challenges and victories.

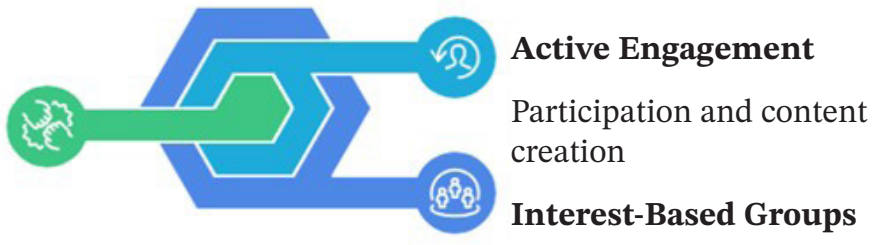


Figure 2.10: Social Media Community Building

Benefits of Community Building

1. Shared Knowledge and Resources: Group members can share educational content, personal experiences and resources.
2. Social Support: Online communities create a space where people feel understood and supported, regardless of location.
3. Global Connectivity: You can connect with people from all around the world, breaking down geographical and cultural barriers.

Crowdsourcing and Collaboration

Social media platforms allow people to contribute and collaborate in previously difficult ways. This is where crowdsourcing comes into play. Crowdsourcing involves gathering input, ideas or resources from a large group of people, typically from a community of social media users.

How Crowdsourcing Works On Social Media

1. Idea Generation: Social media is a powerful tool for collecting ideas and feedback from a large group. Platforms like Twitter (X) and Facebook enable users to ask questions or gather suggestions from their networks. For example, a company could post a survey asking customers for feedback about a new product.
2. Problem-Solving: Crowdsourcing can help in solving complex problems. On Reddit, for example, users often collaborate to solve technical issues, answer questions or share their expertise. Crowdsourced efforts also play a huge role in initiatives like disaster relief or global health campaigns, where people come together to raise awareness and gather resources.
3. Creative Collaboration: Platforms like YouTube or Instagram allow creators to work together, share content and support one another. Creators often collaborate on projects, videos or events, leveraging each other's audiences and expertise.

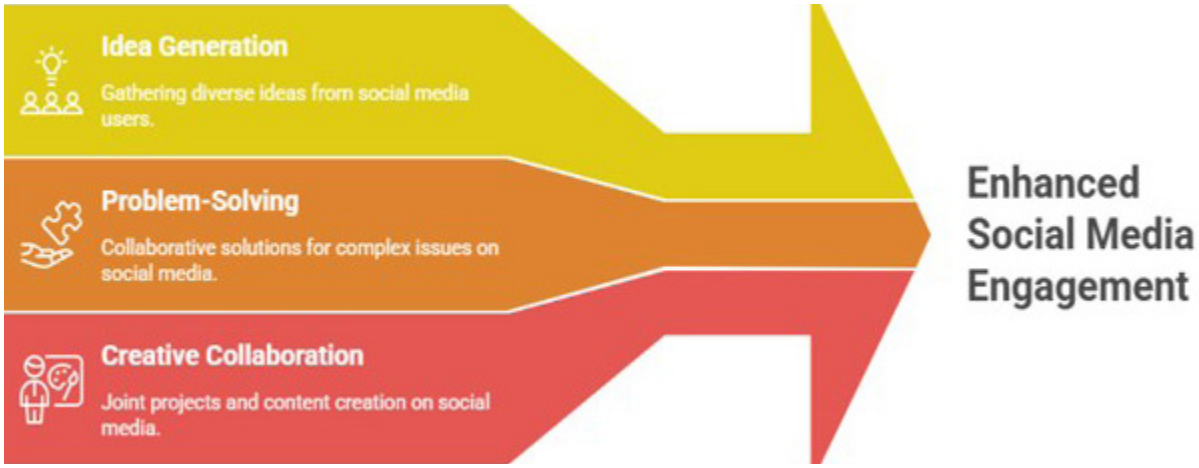


Figure 2.11: Crowdsourcing's Impact on Social Media

Benefits Of Crowdsourcing And Collaboration

1. Efficiency: By tapping into a large community, problems can be solved faster, ideas can be generated quickly, and resources can be pooled more effectively.
2. Access to Diverse Perspectives: Crowdsourcing allows for input from people with various experiences, leading to innovative solutions and ideas.
3. Increased Visibility: Collaboration boosts visibility, as shared projects or content reach a larger audience.

Professional Networking and Career Development

One of the most significant roles of social media today is in professional networking and career development. Platforms like LinkedIn have transformed the way we connect with potential employers, clients and professional peers. They offer opportunities to share expertise, build professional relationships and advance careers.

Using Social Media For Professional Networking

1. LinkedIn: LinkedIn is the leading social platform for professional networking. It allows users to create a professional profile, connect with colleagues, find job opportunities and join groups related to their industry. By sharing content and engaging with others' posts, you can showcase your expertise and become recognised in your field.
2. Personal Branding: Social media platforms such as Twitter (X), Instagram and LinkedIn allow individuals to build and promote their personal brands. By consistently sharing your skills, achievements and professional insights, you can establish yourself as an expert in your field.
3. Job Opportunities and Freelancing: Many job openings are now shared on social media platforms. For instance, companies often post job vacancies on LinkedIn or Twitter. Freelancers can also use platforms like Upwork, Fiverr and Behance to showcase their work and attract clients.

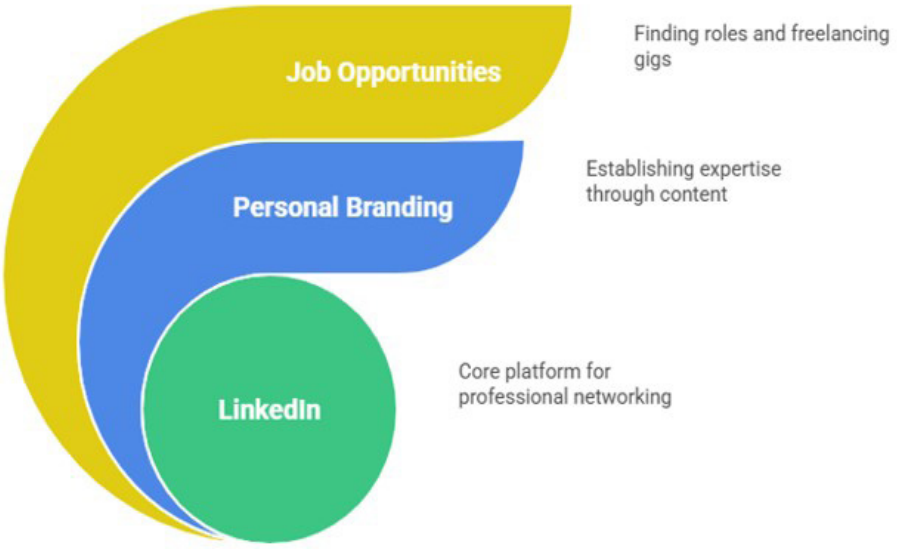


Figure 2.12: Social Media Networking Strategies

Benefits of Using Social Media for Career Development

1. Building Connections: Social media provides the opportunity to connect with industry leaders, potential clients and job seekers.
2. Exposure: Active participation in professional social media networks increases your exposure and visibility in your field, helping you to stand out.
3. Job Opportunities: Many employers and recruiters use social media to find talent, making it easier for you to find job opportunities.

Tips for Using Social Media for Professional Growth

1. Be Active: Regularly engage with posts, share insights and join discussions in your industry to increase your visibility.
2. Curate Your Content: Share content that reflects your expertise, interests and career goals to attract the right audience.
3. Maintain Professionalism: Ensure that your social media profiles reflect a professional image, especially on platforms like LinkedIn.

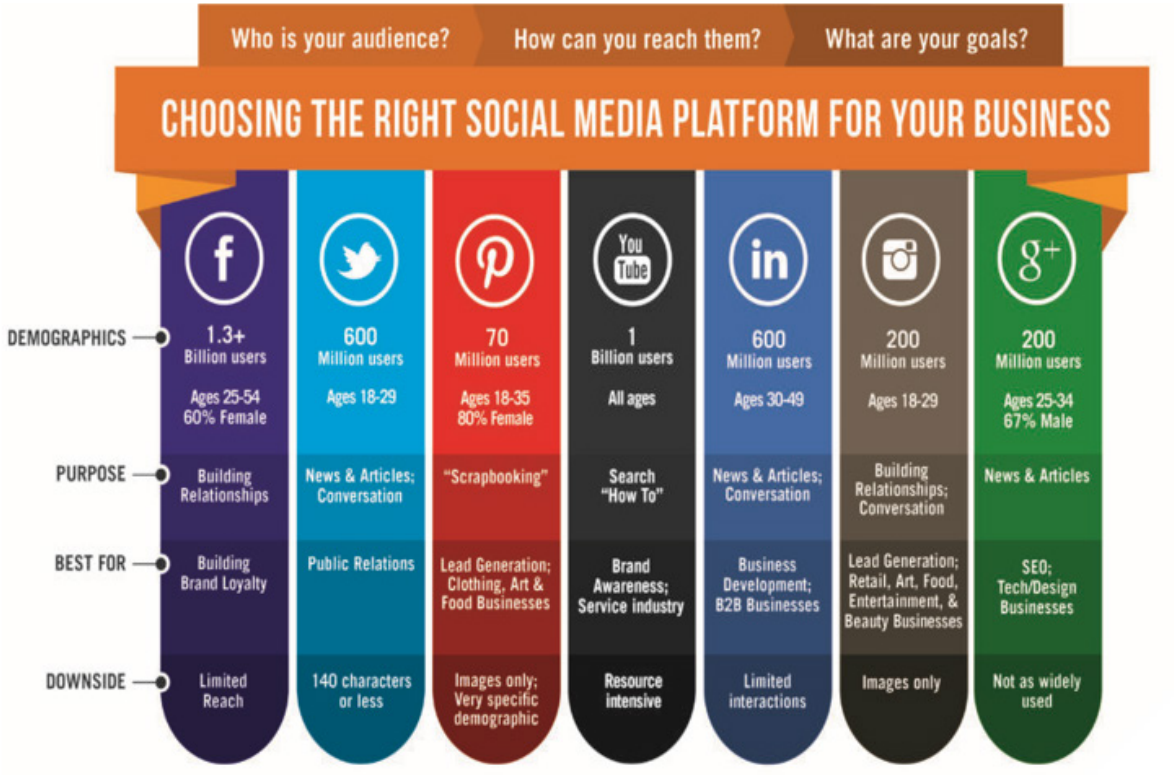


Figure 2.13: Choosing the Right Social Media Platform

Activity 2.4 Social Media in Action

In this activity, you will apply your knowledge of social media tools by creating either a social media campaign or a LinkedIn profile, demonstrating creativity and professionalism.

Steps

1. Organise yourself into a group of 3 or 4 people - based on your interest, choose any one of the concepts: Social Media Campaign or LinkedIn Profile Creation
2. Create a concept for a group or hashtag campaign aimed at promoting a cause, such as #KeepOurSchoolsClean or #SaveOurPlanet, etc., draft a LinkedIn profile for a fictional learner, including the headline, bio and three professional skills.
    a. For the Social Media Campaign
        i. Brainstorm and decide on the cause or topic for their campaign (e.g., school cleanliness, mental health awareness or environmental conservation).
        ii. Come up with a catchy hashtag that aligns with the campaign's goal (e.g., #CleanSchoolsNow).
        iii. Choose a platform for the campaign (e.g., Twitter (X) for quick updates, Instagram for visual content, or Facebook for community groups).
        iv. Decide on the type of content you will share to raise awareness (e.g., posters, photos, videos or infographics).
        v. Create a visual aid (image or video) to support their campaign.
    b. For the LinkedIn Profile:
        i. Write a professional headline that summarises the fictional learner's interests or career aspirations (e.g., "Aspiring Software Developer").
        ii. Write a short bio that outlines the learners' academic background, interests, and career goals.
        iii. Select three skills that are relevant to the learner's career goals (e.g., Communication, Teamwork, Public Speaking).
        iv. Multimedia Use: Add a professional image or any visuals related to the learner's field of interest (e.g., a profile picture, certificates or project images).
3. Refine your task by creating engaging visuals or videos for social media, developing professional headlines and bios on LinkedIn.
4. Presents your social media campaign or LinkedIn profile as a group
5. Provide constructive feedback and learn from each other's work.
6. Reflect on how social media platforms can be used for positive change or professional development.

INTRODUCTION TO SOCIAL MEDIA

What is Social Media?

Social media refers to platforms that allow people to create, share or exchange content in virtual communities and networks. Examples include Facebook, Instagram, Twitter, LinkedIn and YouTube.

Types of Social Media

1. Communication Tools: Facebook, Twitter (X) (for messaging, chatting and quick updates).
2. Collaboration Tools: LinkedIn (professional networking), YouTube (video collaboration).
3. Content Sharing Platforms: Instagram (images), Twitter (X) (text-based posts), YouTube (videos).

The Role of Social Media

Social media allows people to stay connected, share ideas, collaborate and form communities.

Benefits

1. Communication: Enables fast, real-time communication across the globe.
2. Collaboration: Tools like LinkedIn, Facebook Groups and YouTube promote collaboration on various projects.
3. Expression: Allows individuals to express their thoughts, opinions and creativity to a wide audience.

Challenges

1. Cyberbullying: The anonymity of the internet can sometimes lead to harmful behaviour.
2. Privacy Concerns: Personal information shared online is at risk of being misused.

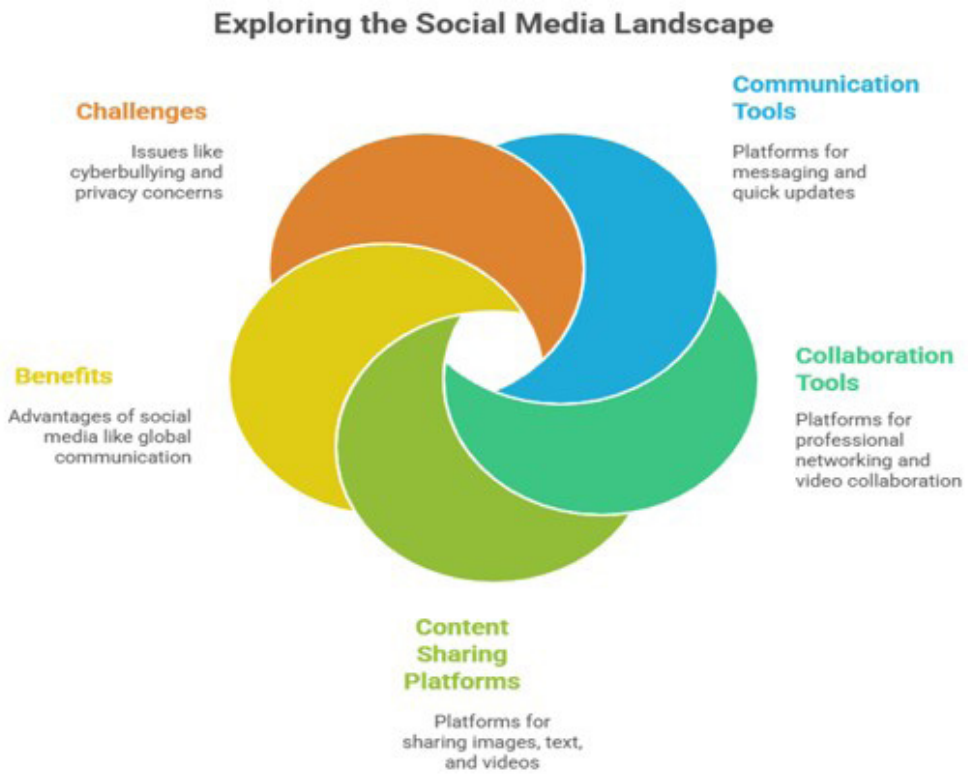


Figure 2.14: Exploring the Social Media Landscape

Table 2.4: Impact of Social Media

Impact Type	Impact Area	Description
Positive	Educational Benefits	YouTube and LinkedIn offer platforms for educational content, professional networking and skill development.
Positive	Global Communication	Social media connects people worldwide, fostering intercultural communication and understanding.
Positive	Social Movements	Platforms like Twitter (X) have been used to promote social causes (e.g. Black Lives Matter, environmental movements).
Negative	Mental Health	Constant use of social media can negatively affect mental health due to comparison, validation-seeking and cyberbullying.
Negative	Privacy Risks	Personal data shared on social media platforms can be exploited by third-party advertisers or hackers.
Negative	Misinformation	Social media can be a breeding ground for false news and rumours that spread quickly.

Creating Content Responsibly on Social Media

Responsible Content

This refers to online material that is created and shared with ethical consideration, accuracy and respect for others. It is a content that:

1. **Is factual and reliable:** Ensures the information shared is true and supported by credible sources.
2. **Respects privacy:** Avoids sharing personal, sensitive, or private information without consent.
3. **Is respectful:** Avoids offensive language, hate speech and harmful behaviour.
4. **Does not promote harmful activities:** Content should not encourage violence, discrimination or illegal activities.
5. **Credits creators:** Always acknowledges the original source of shared content.

Social Media Etiquette

This refers to the guidelines and best practices for interacting respectfully and responsibly on social media platforms. It involves:

1. **Respecting others:** Engage with kindness, avoid offensive language and be mindful of differing opinions.
2. **Thinking before posting:** Consider the potential impact of your posts on others and avoid impulsive or harmful content.
3. **Being authentic:** Share genuine content and avoid misrepresentation of yourself or others.
4. **Engaging positively:** Respond thoughtfully to comments, share relevant content and contribute constructively to discussions.
5. **Respecting privacy:** Avoid sharing personal information without consent and respect others' boundaries.

Protecting Yourself On Social Media

Understanding privacy settings is very critical. Privacy settings are crucial tools on social media platforms to control who can view your posts, personal information and interactions. By adjusting these settings, you can make sure that only trusted individuals can access your private content. Here is how to adjust your privacy settings on various platforms

Table 2.5: Social Media Privacy Settings

PLATFORM	SETTING TYPE	STEPS/DETAILS
Facebook/ Instagram	Profile Privacy	Go to profile settings > Privacy > Select who can see your posts. Choose 'Friends' or 'Only Me'.

Facebook/ Instagram	Contact Privacy	Restrict messages and friend requests to friends only or prevent strangers from finding you.
LinkedIn	Profile Privacy	Go to Settings & Privacy > Privacy > Profile Viewing Options. Choose to keep profile anonymous or visible.
LinkedIn	Activity Privacy	Control visibility of connections, posts and activity feed. Adjust under 'Who can see your connections' and 'Who can see your activity feed'.
LinkedIn	Post Privacy	Limit post visibility to your network, specific people or the public.
Twitter (X)	Tweet Privacy	Go to Settings & Privacy > Privacy and Safety > Toggle on 'Protect your Tweets' to make tweets visible to followers only.
Twitter (X)	Tweet Privacy	Even with protected tweets, be aware that screenshots or reposting can expose your information.

What Is A Digital Footprint?

It is the record of your online activity, including:

a. The content you share on social media (posts, images, videos).

b. Comments, likes and shares on other people's content.

c. Search history, accounts you create and online shopping habits.

d. Data gathered by websites through cookies and analytics tools.

Tips For Managing Your Digital Footprint

a. Regularly Search for Your Name Online: It is essential to regularly check what information is available about you online. This can help you spot any outdated, inaccurate or inappropriate content. You can use search engines like Google to find links to your social media profiles or mentions of your name.

b. Be Cautious About Sharing Too Much Personal Information: Avoid posting sensitive details like your home address, phone number or personal identification numbers on public platforms. Even seemingly harmless details can be pieced together by malicious individuals to invade your privacy.

c. Use Assumed name for Sensitive Online Interactions: When engaging in discussions on public platforms or online forums, consider using a pseudonym or nickname, especially if the conversation could expose you to harassment, spam or phishing attempts. This is particularly important in situations where your real identity could be at risk.

Ethical Considerations of Sharing Content

When sharing content online, it is essential to be aware of ethical considerations, including respecting copyright and being mindful of the content you share.

Copyright And Fair Use

a. Understanding Copyright: Copyright laws protect original works of authorship, including images, videos, music and written content. When using content created by others, you must ensure you have the right to use it or follow the rules of Fair Use. Fair Use allows limited use of copyrighted materials for commentary, criticism, research and educational purposes. However, this is a legal grey area, and you should not make a mistake, asking for permission whenever possible.

b. Give Credit to Creators: Whenever you share or repost content created by someone else (images, videos, music, articles), always give them credit. This can be as simple as tagging the creator or including a caption such as "credit: @ username" or "photo by [creator name]."

c. Ask for Permission If you want to use copyrighted content (such as music in a video or an image in your post), always ask the creator for permission. Many creators are happy to share their work if credited properly.

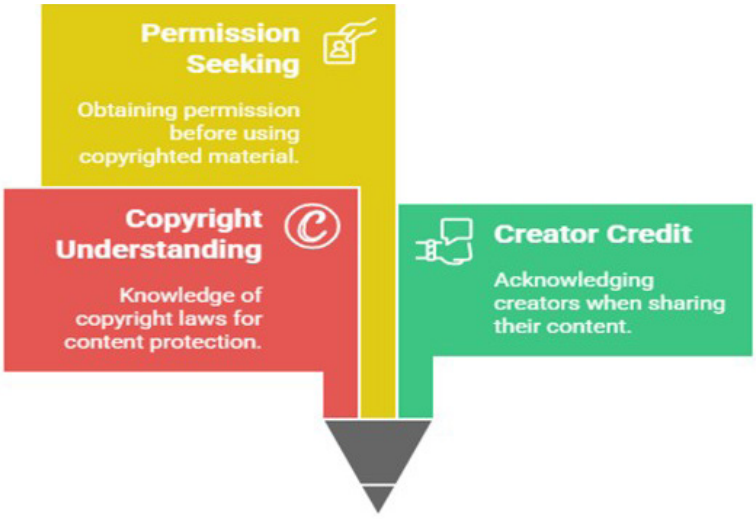


Figure 2.15: Navigating Copyright Responsibly

Respecting Other People's Content

a. Do not Steal or Misuse Content: Just because something is available on the internet does not mean it is free to use. Plagiarism (copying someone's work without giving credit) is not only unethical but may also result in legal consequences. For example, copying an article or blog post without permission and claiming it as your own is considered stealing.

b. Make Sure You Have the Right to Share Anything Before Posting: Before reposting or sharing someone else's content, make sure you have permission or that it is public domain or licensed for reuse. Some social media platforms offer Creative Commons licenses for images or videos that allow others to use them as long as they follow the license terms.

c. Always Respect the Creator's Intentions: If someone posts a photo or video online, consider whether sharing it is in line with their original intent. For instance, sharing someone's private photo without permission, even with good intentions, could cause harm or discomfort to the creator.

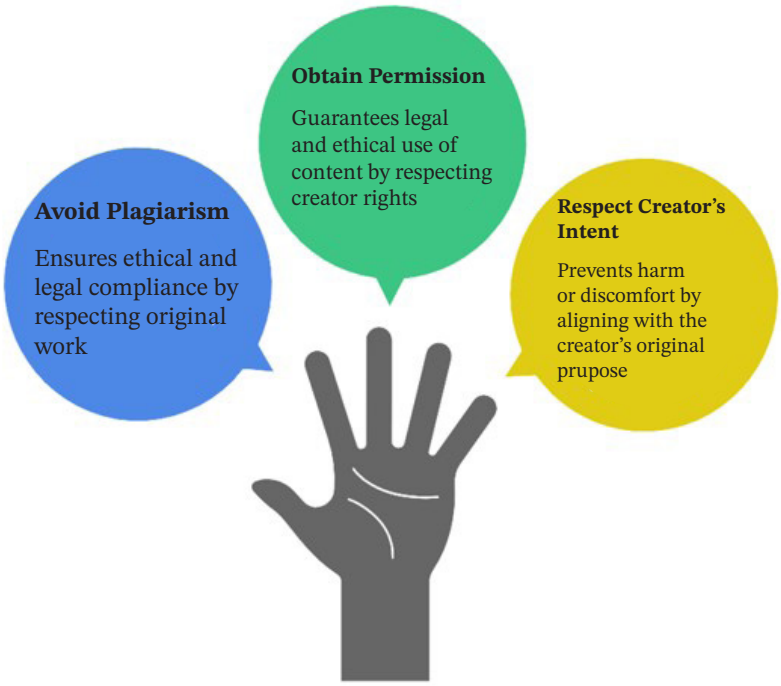


Figure 2.16: How to Ethically Use Online Content

Activity 2.5 Social Media Awareness Skit/Poster Creation

This activity will help you to create a 2-minute skit or poster showcasing a positive or negative example related to one of the four topics (E.g., Content Creation, Digital Literacy, etc).

1. Organise yourself into a group of 3 to 4 people, and choose one of the following topics
   a. Content Creation
   b. Digital Literacy
   c. Privacy/Security and
   d. Ethics.
2. Create a 2-minute skit or poster that demonstrates a positive or negative example related to their assigned topic. If it is a skit: Use role-play to show an example of either responsible or irresponsible behaviour on social media. If it is a poster: Visually represent the key message related to their topic (e.g., infographics, pictures and slogans).

Examples

a. Content Creation: Show the difference between responsible content creation and misleading content.
b. Digital Literacy: Demonstrate how to critically evaluate online information.
c. Privacy/Security: Show the importance of protecting personal information online vs. oversharing.
d. Ethics: Show ethical behaviour on social media vs. engaging in cyberbullying.

3. Still in your groups, discuss the key message of the skit or poster, such as: What was the main point the skit/poster was trying to convey? How did the scenario demonstrate positive or negative social media behaviour?
4. Collaborate to plan, create and rehearse your skit or design your poster.
5. Act out scenarios that demonstrate responsible or irresponsible online behaviour.
6. Perform your skits, followed by a brief explanation of the message you are conveying.
7. Present your posters and explain the message behind your visuals.
8. Reflect on what you learned from the skit/poster? How can you apply the lesson to your own social media use?

EXTENDED READING

- https://www.researchgate.net/publication/318735568_Impact_of_Social_Media_on_Society
- https://www.techsmith.com/blog/synchronous-vs-asynchronous-communication/
- https://blog.hubspot.com/marketing/social-media-campaigns
- https://www.themuse.com/advice/the-ultimate-guide-to-building-your-linkedin-profile

- https://www.sciepub.com/portal/downloads?doi=10.12691%2Feducation-12-10-2&filename=education-12-10-2.pdf



- https://www.socialinsider.io/blog/social-media-in-education/



- https://sproutsocial.com/insights/what-to-post-on-each-social-media-platform/



REVIEW QUESTIONS

1. What are some examples of digital tools that help with communication in Ghana and how do they support both teachers and learners in learning?
2. Evaluate the impact of digital tools on the way learners consume media and entertainment. How have platforms like YouTube, Spotify or TikTok changed the way learners in Ghana access entertainment and what are the benefits and challenges?
3. What are the primary differences in how social media platforms like Facebook, Instagram and Twitter (X) are used for communication and collaboration? Provide examples of use cases for each.
4. You are managing a project with team members in different time zones. How would you use both synchronous and asynchronous communication tools to ensure efficient collaboration?
5. What effect do social media platforms like Facebook and Instagram have on communication among teenagers?
6. How can you determine which social media platform is most suitable for a specific purpose, such as creating awareness for a social cause or networking professionally? Provide examples.
7. Social media can sometimes contribute to mental health issues, especially among teenagers. How can young people in Ghana protect themselves from the negative effects of social media while using it for connection and learning?
8. You need to share class materials and assignments with your classmates who have different schedules. How would you use asynchronous communication tools like email or Google Drive to ensure everyone can access the information?
9. You are planning a campaign on social media to raise awareness about mental health. How would you design a hashtag campaign and what platform(s) would you choose to reach your target audience effectively?

SECTION

3

COLLABORATION TOOLS FOR COMMUNICATION AND SYNCHRONISATION



ICTS In The Society

Connecting And Communicating Online

INTRODUCTION

In Year 2, you learned about the purpose and uses of digital devices like smartphones, digital cameras and wearable tech, along with the evolution of the internet and the role of internet service providers. Now, in this section, you will explore how digital communication tools like Zoom and Google Meet enhance remote learning and collaboration. You will understand the difference between synchronous (real-time) and asynchronous (self-paced) tools and how they improve productivity and communication. By the end of this section, you will know how to set up accounts, adjust security settings and keep your personal data safe. Additionally, you will learn how integration and interoperability make different tools work smoothly together, transforming your learning experience and helping you stay connected, whether you are in class or collaborating on a group project. Get ready to boost your digital skills and enhance your online learning journey.

KEY IDEAS

- Asynchronous communication tools offer flexibility
- Digital communication tools are essential for modern learning
- Interoperability allows tools to share data
- Privacy settings protect your personal information
- Synchronous communication tools enable real-time interaction
- Virtual collaboration tools improve group work

EXPLORING TOOLS FOR MODERN COMMUNICATION AND COLLABORATION

Activity 3.1 Exploring Tools for Modern Communication and Collaboration

This activity will help you recall and reinforce your knowledge of the purpose and uses of digital devices (e.g., smartphones, digital cameras, etc) and the evolution of the internet.

Steps

1. In pairs, discuss how the digital devices explored in your earlier lessons (e.g., smartphones, cameras, etc.) and the internet have paved the way for more efficient communication and collaboration tools used in remote learning and work.
2. Individually think about the digital devices you have used or learned about (e.g., smartphones, digital cameras, etc.) and how these devices have improved communication or entertainment.
3. In pairs, share your thoughts and discuss the impact of these devices in your daily live.
4. Discuss the following in your small groups.
    a. Which digital device do you find most useful for learning, communication or entertainment and why?
    b. How has the evolution of the internet (from dial-up to broadband and mobile data) impacted your ability to learn or work online?
    c. How have digital tools like smartphones or laptops have helped you collaborate with classmates or teachers?
5. Share your insights with the class.
6. Reflect on these questions to link your previous knowledge to the new section.
    a. What are some communication tools (e.g., Zoom, Google Meet) that help with remote learning and virtual work?
    b. How do you think the devices (e.g., smartphones, digital media players, etc.) you explored earlier can be integrated with these tools for effective online learning and work?
    c. How have communication tools changed the way you interact with others online?
7. Draw connections between your previous knowledge of digital devices and the role of communication tools in virtual collaboration.

UNDERSTANDING COMMUNICATION TOOLS

What Are Communication Tools?

Communication tools are platforms or applications that enable people to interact and exchange information. These tools can be categorised based on the time aspect of communication.

1. **Synchronous (Real-time) Communication:** Communication that happens in real-time, where participants exchange messages instantly. Examples: Video conferencing, instant messaging, phone calls.
2. **Asynchronous Communication:** Communication that does not require participants to be available at the same time. Examples: Email, recorded video messages, forums and intranet posts.

Table 3.1: Differences and Similarities Between Synchronous and Asynchronous Communication

ASPECT	SYNCHRONOUS COMMUNICATION	ASYNCHRONOUS COMMUNICATION	SIMILARITIES	EXAMPLE
Time of Interaction	Happens in real-time; both parties communicate simultaneously.	Communication happens with a time delay; not both parties communicate at the same time.	Both involve exchanging information.	Zoom meeting vs. email communi-cation.
Examples	Video calls (Zoom, Google Meet), phone calls, live chats.	Emails, forum posts, recorded videos, text messages.	Both involve digital communication.	WhatsApp message vs. email.
Response Time	Instant response required from the recipient.	Response can be delayed and can happen anytime.	Both can be used to communicate effectively.	Twitter chat vs. blog post reply.
Dependence on Availability	Both parties must be available at the same time to communicate.	No need for both parties to be online at the same time.	Both are used for communication purposes.	Live webinar vs. recorded YouTube video.

Synchronous Communication Tools

Synchronous communication happens in real-time, allowing users to communicate and interact instantly. Below are common tools and how to set them up

Table 3.2: Steps to set up Zoom on Android

STEP	INSTRUCTIONS
1. **Download Zoom**	• Open the Google Play Store on your Android device. • Search for 'Zoom Cloud Meetings'. Tap Install.
2. **Create a Zoom Account**	• Open the Zoom app after installation. Tap Sign Up if you don't have an account or tap Sign In if you already have one. • Follow the prompts to create a Zoom account using an email address or sign in with Google or Facebook.
3. **Schedule or Join a Meeting**	• To schedule a meeting: Tap on Schedule. Set the time, date and meeting options (e.g., enable video, require a password). • To join a meeting: Tap Join and enter the Meeting ID and Password (if required).
4. **Host/Join a Meeting**	• Once the meeting is scheduled, participants can use the meeting link or ID to join. • During the meeting, tap the screen to see options like mute/unmute microphone, start/stop video, share screen and chat.

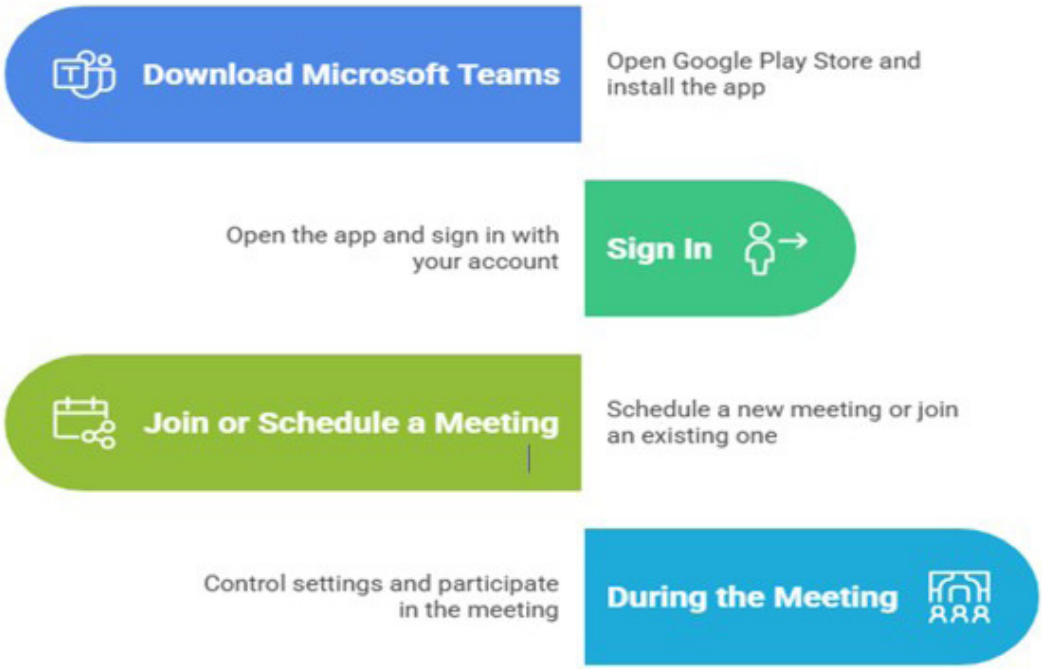


Figure 3.1: Microsoft Teams for Meetings

Asynchronous Communication Tools

Asynchronous communication allows participants to send and receive messages at different times, without needing to be online at the same time.



Figure 3.2: Mastering Gmail

Table 3.3: Setting Up WhatsApp (Instant Messaging)

STEP	INSTRUCTIONS
1. **Download WhatsApp**	• Open the Google Play Store. • Search for 'WhatsApp'. • Tap Install.
2. **Set Up WhatsApp**	• Open the WhatsApp app after installation. • Enter your phone number and verify it by entering the OTP (One-Time Password) received via SMS.
3. **Send a Message**	• To message someone, tap the Chat icon (speech bubble) at the top right. • Select a contact or create a new one, then type and send your message. You can also send voice messages, images, videos and files using the attachment icon.
4. **Creating Groups**	• Tap the three dots (menu) in the top right corner and select New Group to create a group. • Add contacts, name the group and start chatting.

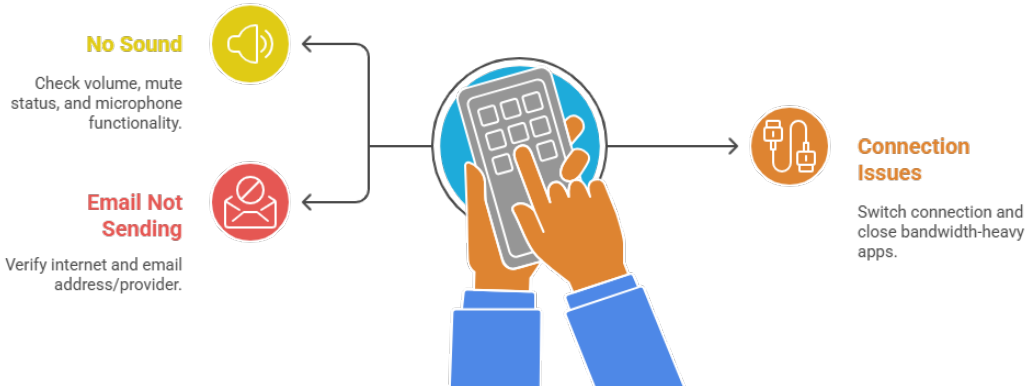


Figure 3.3: Troubleshooting Tips

Table 3.4: Troubleshooting Tips

ISSUE	TROUBLESHOOTING STEPS
No Sound During Zoom/ Meet/Teams	1. Ensure that the device volume is up. 2. Check if you're muted in the app (icon with a microphone). 3. Ensure your microphone is working by testing it in another app (e.g., voice recorder).
Connection Issues	1. If the connection is slow or drops, switch to a more stable internet connection (Wi-Fi or mobile data). 2. Close other apps consuming bandwidth during video calls.
Email Not Sending	1. Make sure you have a stable internet connection. 2. Ensure there is no issue with the recipient's email address or your email service provider.

Activity 3.2 Matching Communication Scenarios with the Most Suitable Tool

The purpose of this activity is to help you identify and match appropriate communication tools to real-world scenarios.

Steps

1. Organise yourself into a group of 3-5 people. Each group will receive communication scenarios (Group Assignment in Different Time Zones, Emergency School Announcement) and a set of tools (e.g., Zoom, Google Meet, WhatsApp, email, Google Docs, etc.)
2. Match each communication scenario with the most appropriate tool.
3. Discuss the communication scenarios you worked on, how you matched the scenarios with tools and why you made those choices.

4. Demonstrate how to use the tool in the context of the chosen scenario. Example: WhatsApp to send a voice note to a group chat. Google Docs to collaborate on a document and leave comments.
5. Reflect on why it is important to match the right tool with the right communication scenario. How social media platforms enhance communication and collaboration for global teams or communities

CREATE ACCOUNTS AND CONFIGURE TOOLS

Setting up accounts on communication tools such as Gmail, Zoom, Microsoft Teams, or Slack is the first step toward using these platforms. Follow these steps to create and configure your account for secure and effective use.

Table 3.5: Steps to Create Accounts

STEP	DESCRIPTION	PURPOSE/USE
Enter Basic Information	Input your name, email and password to create an account. Choose a strong password with a mix of letters, numbers and special characters.	Ensure account security by selecting a strong password and verifying identity.
Verify Email or Phone Number	Verify your email or phone number through a code sent via email or SMS.	Confirm your identity and secure the account by completing the verification process.
Set a Strong Password and Enable 2-Step Verification	After creating your account, set a strong password and enable 2-step verification (2FA) for added security.	Provide an extra layer of security, making it harder for unauthorised people to access your account.
Customise Profile	Upload a profile picture, select your time zone and set your language preferences.	Personalise your account to reflect your needs and preferences.
Connect Tools	Sync your calendar or contacts to platforms like Google Meet or Microsoft Teams.	Make communication and scheduling easier by syncing important contacts and events.
Adjust Notification Preferences	Tailor your notification settings to receive only relevant updates about meetings, messages or events.	Ensure you receive only the most important updates, reducing unnecessary distractions.
Manage Roles and Permissions	In tools like Zoom or Microsoft Teams, set roles (host, participant) and permissions (e.g., sharing screen or editing documents).	Control who has access to specific features of the platform, ensuring efficient use of the tool.

Security and Privacy

When using digital communication tools, security and privacy are crucial for ensuring safe online communication. Here are some important concepts to help you stay secure

Security Concepts

1. **Encryption:** Is the process of converting data into a code so that it is unreadable by unauthorised individuals. This ensures that when you send emails, messages or make video calls, only the intended recipient can read or view the content. For example, WhatsApp uses end-to-end encryption to secure your messages.
2. **Authentication:** Is the process of confirming that a user is who they say they are. This is done through passwords, One-Time Passwords (OTP) or two-factor authentication (2FA). Always use strong passwords and enable 2FA to verify your identity before accessing important accounts.
3. **Access Control:** This determines what a user can or cannot do within an application after they log in. For example, in Google Docs, you can set view-only or edit permissions to control who can interact with your documents. This protects your information from being accessed or edited by unauthorised people.

Privacy Best Practices

1. Do not Share Login Details: Never share your account passwords or login information with anyone.
2. Avoid Public Wi-Fi Without a VPN: Public Wi-Fi networks are not secure. Use a VPN (Virtual Private Network) when using public Wi-Fi to protect your data.
3. Regularly Update Passwords: Change your passwords regularly and avoid using the same password across multiple platforms.
4. Limit App Permissions: Review the permissions granted to apps on your phone. For example, limit access to your microphone, location or camera unless necessary.

Compliance And Data Protection

1. Data Protection Laws: In Ghana, the Data Protection Act ensures that personal data is protected from misuse. In the EU, the GDPR (General Data Protection Regulation) governs how personal data is collected, used and shared. Always be aware of the privacy policies and terms of use of the platforms you interact with.
2. Be Cautious with Sensitive Data: Never share sensitive personal information (such as financial data) unless you are certain the platform is secure.
3. Respect Digital Consent: Always ask for consent before sharing images, documents or information related to others, especially in professional settings.

Activity 3.3 Secured Account Setup Simulation

The purpose of this activity is to help you securely set up digital accounts (e.g., Zoom).

1. Select a platform (e.g., Zoom, Gmail or Slack) and follow the instructions to securely set up your account.
2. Understand the security features you will configure
    a. Setting a strong password
    b. Enabling two-factor authentication (2FA)
    c. Adjusting privacy and notification settings
    d. Linking calendars or setting profile preferences.
3. Think about the risks of having an unsecured online account (e.g., privacy loss, hacking, misuse of personal information).
4. Pair up with a colleague and share your thoughts on why a strong password and 2FA are essential for account protection.
5. Share one important point with the whole class about securing accounts (e.g., "A strong password helps protect your data from hackers").
6. Create your accounts on the selected platform (Zoom, Gmail or Slack) by following these steps.
    a. Set a strong password.
    b. Enable 2FA (where applicable).
    c. Adjust privacy and notification settings.
    d. Link calendar or set profile preferences.
7. Share your experiences of setting up the accounts with your peers.
8. Reflect on the questions to prompt discussion:
    a. What did you find challenging during the setup process?
    b. Why is it important to enable 2FA and adjust privacy settings?
    c. How do you feel more confident using these tools now that you know how to secure your account?

INTEGRATION, INTEROPERABILITY, REMOTE WORK AND VIRTUAL COLLABORATION

In today's digital world, using different communication tools together faultlessly is essential for improving productivity, especially in education and professional settings. Understanding how these tools work together can make learning and teaching more efficient. Let us break it down.

Integration refers to connecting various digital tools to work together faultlessly. For example, a Learning Management System (LMS) like Google Classroom can integrate with tools like Google Docs and Google Meet, allowing teachers to assign work, provide feedback and hold live discussions without needing to switch between platforms.

How Integration Helps in Education

1. **Centralised Communication:** Integration allows teachers and learners to communicate easily in real-time, whether they are online or offline. This makes it easier for everyone to stay connected and informed about assignments, announcements and deadlines.
2. **Efficient Content Delivery:** Teachers can distribute learning materials, track assignments and give feedback without having to use several different platforms. This reduces confusion and makes it easier for learners to access what they need.
3. **Collaborative Learning:** Digital tools like Google Docs or Trello enable group work and discussions. This makes learning more interactive and dynamic, helping learners learn from each other.
4. **Aligning with National Goals:** Using platforms like iCampus GH alongside local educational platforms ensures that the tools are aligned with national educational goals in Ghana.

Key Communication Tools for Education in Ghana

Learning Management Systems (Lms)

A Learning Management System (LMS) is an online platform used to organise and manage learning activities. It allows teachers to upload course materials, assign tasks and track learners' progress. Learners can access lessons, submit assignments and get feedback all in one place. Examples of LMS platforms include Google Classroom and Moodle.

Table 3.6: Learning Management System in Summary

Aspect	Description	Examples/Details	Benefits
Examples	Commonly used platforms for managing learning	Google Classroom, Moodle	Helps organise assignments, grades and course materials in one place.
What They Do	What the platform provides to teachers and learners	Post assignments, grades and announcements. Central hub for course-related activities.	Provides a centralised location for all course materials, making teaching and learning more efficient.

Integration	How LMS works with other tools	Can link to Google Docs or Microsoft Word for assignment submission. Sync calendars for deadlines.	Allows easy access to resources and keeps learners on track with reminders.
Benefits	How LMS helps improve the learning experience	Keeps assignments and grades organised. Provides learners with easy access to all course materials.	Increases productivity, reduces confusion and enhances the learning experience by having everything in one place.

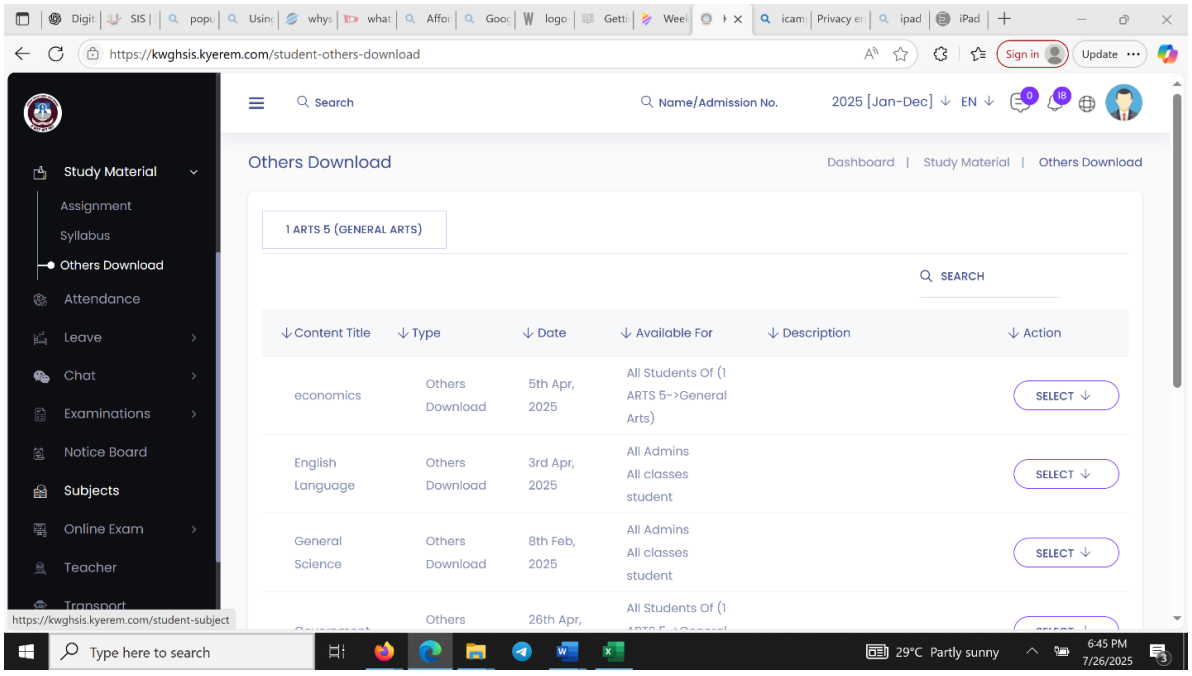


Figure 3.4: Learning Management System Interface

Video Conferencing Tools

a. **Examples:** Zoom, Google Meet, Microsoft Teams

b. **What They Do:** These tools allow teachers to hold live, online classes. Learners can join discussions, ask questions and engage in real-time lessons.

c. **Integration:** You can conduct live lessons and even share your screen to show assignments, documents or presentations.

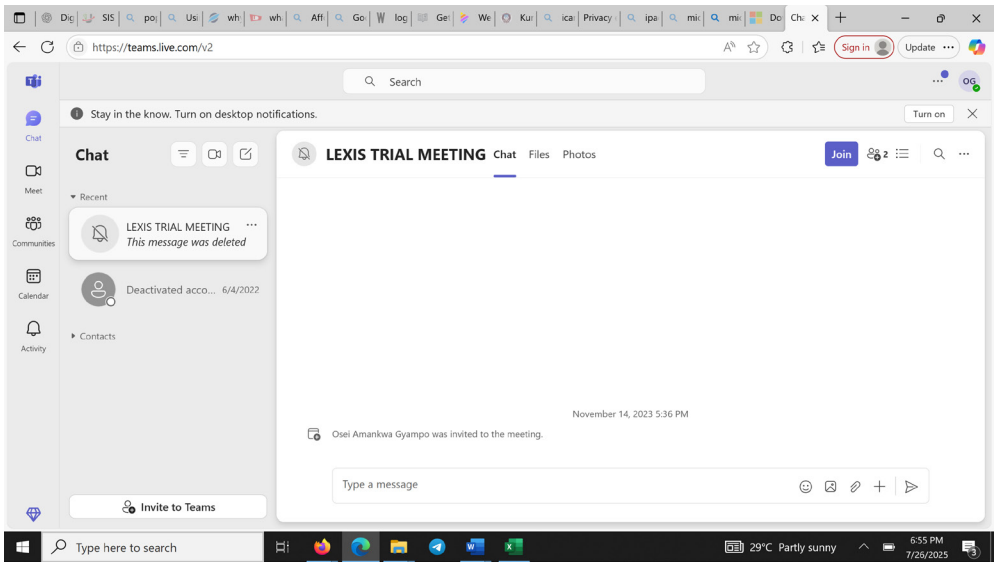


Figure 3.5: Video Conferencing Tool (Microsoft Teams) Interface

Instant Messaging and Collaboration Tools

a. **Examples:** WhatsApp, Slack, Microsoft Teams

b. **What They Do:** These tools allow for quick, real-time communication. They are great for informal discussions, group chats and project collaboration.

c. **Integration:** Teachers and learners can easily share ideas, ask questions and get quick feedback in a less formal setting.

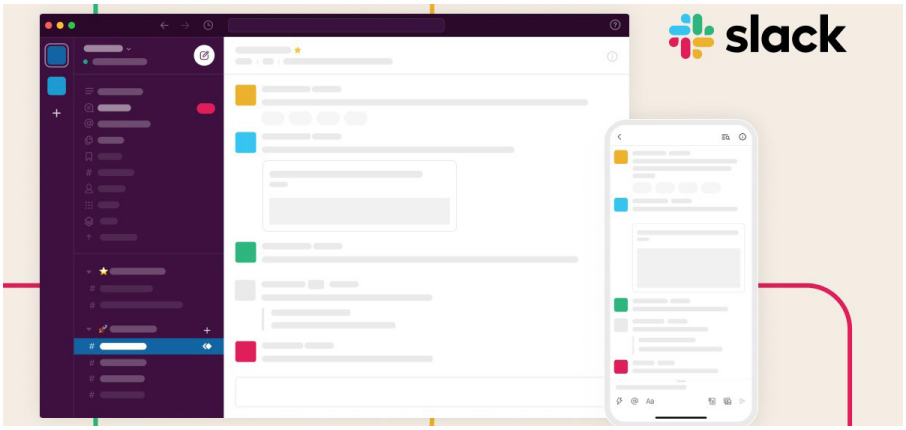


Figure 3.6: Instant Messaging and Collaboration Tools (Slack)

Productivity Suites

a. **Examples:** Google Workspace (Docs, Sheets, Slides, Drive), Microsoft Office 365 (Word, Excel, PowerPoint, OneDrive)

b. **What They Do:** These tools allow learners to create, share and collaborate on documents, spreadsheets and presentations.

c. **Integration:** You can create documents with classmates and track changes in real-time, ensuring collaboration is efficient and smooth.

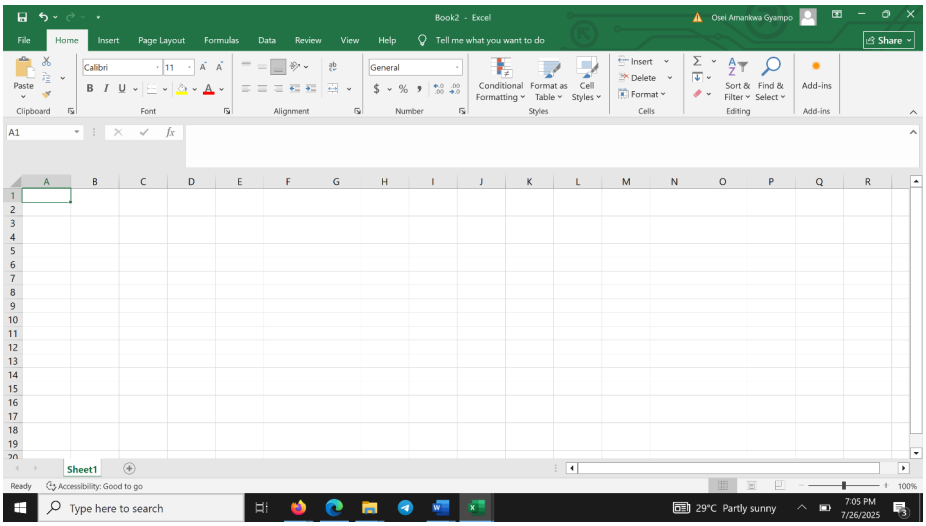


Figure 3.7: Productivity Suite (Ms Excel)

Content Creation And Engagement Tools

a. **Examples:** Kahoot!, Quizizz, EdPuzzle, Canva

b. **What They Do:** These tools make learning fun! They help you create interactive quizzes, games and visuals to engage learners.

c. **Integration:** These tools can be integrated with LMS platforms to enhance learning experiences and provide interactive lessons.

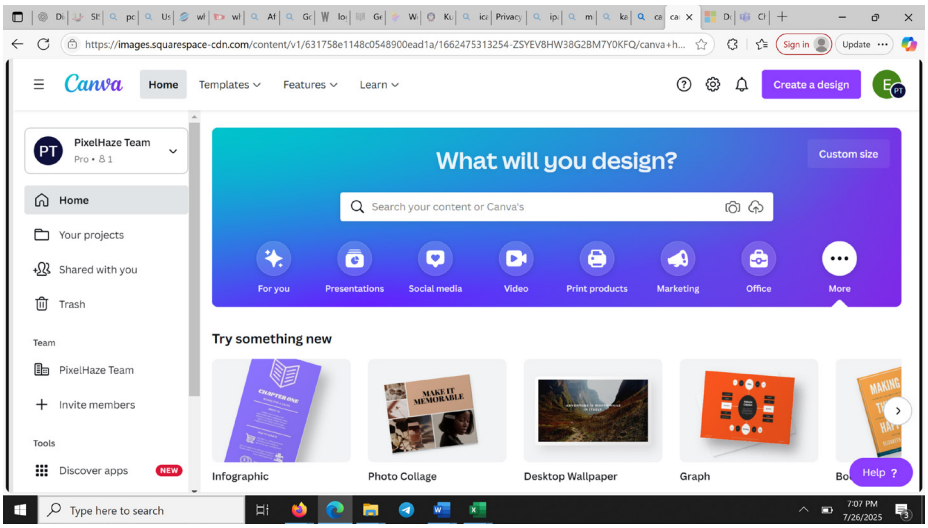


Figure 3.8: Content Creation and Engagement Tools (Canva)

Offline Solutions

a. **Example:** CENDLOS's iBox

b. **What It Does:** This tool provides offline access to educational content, which is particularly useful in areas where internet connectivity is limited.

c. **Integration:** When learners access learning materials offline, they can sync their progress and submit assignments when they regain internet access.

Integration Options To Streamline Workflows

1. **Centralised LMS as the Hub**
    a. **How It Works:** Teachers use the LMS (like Google Classroom) to manage assignments, feedback and announcements.
    b. **Example:** Learners submit their work via the LMS, which links to tools like Google Docs or Microsoft Word for easy editing and feedback. Teachers can also sync announcements with their calendars.
2. **Offline-Online Synergy (Crucial for Ghana)**
    a. **How It Works:** In rural areas or areas with limited internet, learners can access offline content via tools like CENDLOS's iBox.
    b. **Syncing When Online:** Once learners have internet access, they can sync their progress, submit assignments and join online classes.
    c. **Blended Learning:** Teachers can design workflows that combine online and offline learning, ensuring all learners stay engaged, even without continuous internet access.

Interoperability Options for Enhanced Productivity

Interoperability is the ability of different tools or platforms to communicate and share data. When digital tools are interoperable, it allows users to easily sync calendars, contacts and documents between different platforms (e.g., syncing Microsoft Teams with Outlook for scheduling meetings). This reduces duplication of effort and enhances overall workflow.

1. **Cloud-Based Platforms**
    a. **What They Do:** Cloud platforms like Google Drive and OneDrive let learners and teachers store and access their work from any device, whether it is a phone, tablet or computer.
    b. **Benefits:** These tools also update automatically, so there is no need for manual updates. Additionally, they do not take up much space on local devices, making them easier to manage.
2. **Relevance for Ghana**
    a. **Digital Inclusion:** In Ghana, where internet access can vary, cloud-based solutions allow learners to continue their work on any device, and once they regain internet access, their progress automatically syncs.

Remote Work and Virtual Collaboration

These are becoming the norm in many fields. Remote work allows people to work from anywhere, using digital communication tools like Zoom, Google Meet and Slack to stay connected. Virtual collaboration tools, such as Microsoft Teams or Trello, enable teams to work on projects in real time, no matter where they are located. These tools allow for shared documents, real-time editing and instant messaging, making it easier to collaborate and achieve goals without physical meetings.

Activity 3.4 Mastering Digital Tools for Virtual Learning

The purpose of this activity is to help you develop practical skills in using digital platforms like Zoom, Google Meet and Slack for virtual learning and collaboration.

1. Select a platform (e.g., Zoom, Google Meet, Slack, or Microsoft Teams) based on the devices available. Note that mastering these tools is important for effective remote learning and collaboration in today's digital environment.
2. Think about which platform you are most familiar with (Zoom, Google Meet, etc.) and how you have used it for learning or communication before.
3. Pair with a colleague and share your thoughts about what they know about using your selected platform and its purpose in education.
4. Share with the whole class one interesting point about how the platform can be used for virtual learning.
5. Set up your platform by selecting any one of the platforms (e.g., Zoom) and demonstrate the following:
    a. Creating an account and logging in.
    b. Scheduling a meeting or virtual class and sharing the invite link.
    c. Using key features like screen sharing, mute/unmute and video on/off.
    d. How to join a meeting using the invite link.
    e. Setting up breakout rooms for group work (if applicable).
6. Repeat the process for the other platforms (Google Meet, Slack, or Microsoft Teams), depending on the platforms available and your selected tools.
7. Reflect on the platforms demonstrated and discuss the challenges and benefits of using digital tools for virtual learning.

S/N	Reflection Question	Student Responses
1	Which platform do you find easiest to use and why?	
2	What are some benefits of using these digital platforms for learning?	
3	What challenges do you think learners might face when using these platforms for virtual lessons?	

EXTENDED READING

- https://onlineteaching.umich.edu/articles/introduction-to-communication-tools/



- https://ctl.uaf.edu/synchronous-communication/



- https://onlineteaching.umich.edu/articles/asynchronous-tools-and-how-to-use-them/



- https://www.magicedtech.com/blogs/5-approaches-to-ensure-security-privacy-in-learning-platforms?utm_source=chatgpt.com



- https://edtechbrief.com/qa/15-tips-to-ensure-security-and-privacy-in-elearning-programs?utm_source=chatgpt.com



- https://edtechmagazine.com/higher/article/2020/03/how-universities-are-approaching-integrated-and-interoperable-edtech-tools



- https://www.educationdive.com/news/why-interoperability-matters-for-remote-learning-and-work/602897/



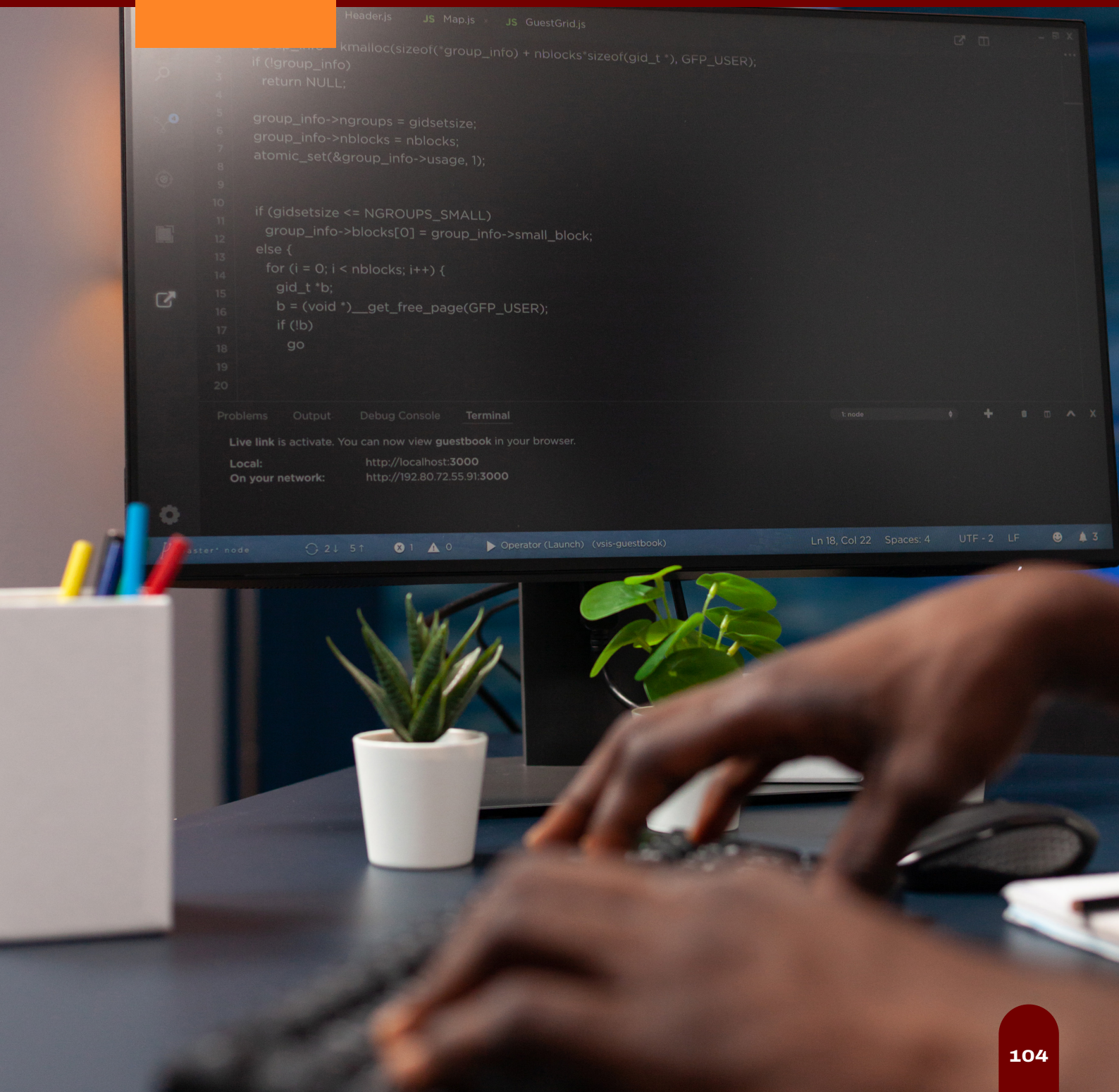
REVIEW QUESTIONS

1. How does enabling two-factor authentication (2FA) enhance the security of your online accounts? Provide an example of how it works.
2. Evaluate the importance of adjusting privacy settings when setting up accounts on social media or communication platforms like Facebook or WhatsApp. How would you advise a friend in Ghana to protect their personal information online?
3. How can you combine tools like Zoom for live lessons and Google Classroom for assignments to help learners in Ghana learn better?
4. How would you use Zoom for live lessons and Google Classroom for homework if learners have limited internet access?
5. How would you integrate tools like Google Meet and Google Classroom to improve collaboration and streamline workflows in a remote learning environment? Discuss the benefits and challenges of this integration.
6. Analyse how interoperability between various educational tools, such as Google Classroom, iCampusGH and Microsoft Teams, could improve the learning experience for learners in Ghana. Consider challenges such as internet access, device availability and user training and propose strategies to overcome these challenges to enhance virtual collaboration.

SECTION

4

WEBSITES & DIGITAL MEDIA ON THE WEB



ICTS IN THE SOCIETY

Connecting and Communicating Online

INTRODUCTION

In Year 2, we explored various smartphones, digital cameras, wearable devices, game consoles, e-book readers and portable media players, learning about their purposes and uses. We also studied the evolution of the internet, tracing its development from its early days to the modern web we use today and identified the role of internet service providers (ISPs) in delivering internet services.

Now, get ready to dive into the fascinating world of websites and digital media! You will explore different types of websites and the multimedia elements that bring them to life, including graphics, audio, videos and plug-ins that enhance functionality. Whether you are a designer, content creator or simply curious, understanding these digital tools is key to navigating the web. You will also learn how websites creatively use these elements to engage users and improve their experience.

We will then break down HTML, CSS and JavaScript, exploring how these tools shape a website's structure. Finally, we will cover accessibility and copyright in web design, ensuring everyone enjoys digital content responsibly. Get ready for an exciting adventure!

KEY IDEAS

- **Accessibility:** Designing content, tools, and environments so that all people (including those with disabilities) can use them easily
- **Copyright:** The legal right that gives the creator of original work (such as books, music, videos, or software) control over how it is used and shared
- **Interactive Media:** Interactive digital media engages users in two-way communication, allowing them to interact with content
- **Plagiarism:** The act of using someone else's words, ideas or work without giving proper credit.
- **Streaming Services:** Websites and services like Netflix, Spotify and Hulu offer streaming of audio and video content in real-time.
- Websites are designed to serve different purposes, from informational (providing data or knowledge) to transactional (enabling online shopping or services).

WEB DEVICES

Activity 4.1 From Devices to the Web

This activity will help you recall the purpose and uses of various digital devices and understand how internet services support their functions, preparing you to explore different types of websites.

1. Match each device below to the correct type of content or service it commonly accesses online.

Device	Online use or service
Smartphone	Accessing podcasts and music
E-book Reader	Streaming music/videos
Digital Camera	Downloading and reading e-books
Wearable Device	Playing multiplayer online games
Game Console	Uploading photos to cloud/gallery
Media Player	Syncing health data online

2. How has the internet developed over time?
3. Mention two internet service providers (ISPs) in Ghana and say one thing each of them does.

Types of Websites

There are many types of websites, and each serves a different purpose. Some websites focus on providing information, while others are built for entertainment or commerce. Let us look at some common types of websites, with Ghanaian and African-based examples:

Informational Websites

a. **Purpose:** These websites provide valuable content to inform and educate users. They typically focus on offering data, research and articles.

b. **Key Features:** Informational websites often contain news articles, research papers, academic information, government reports, etc.

c. **Example:** GhanaWeb.

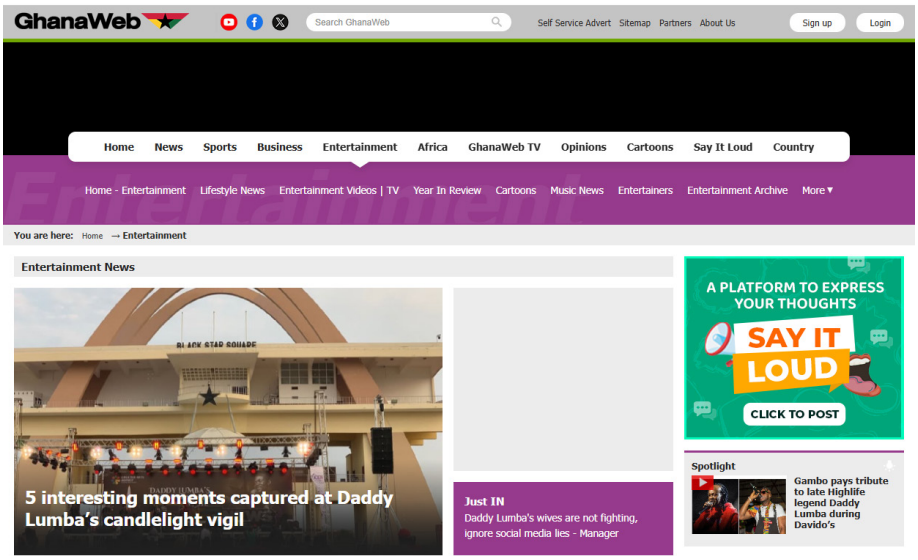


Figure 4.1: GhanaWeb site. A major online news outlet offering updates on politics, sports, and current events in Ghana. (Click link to visit site)

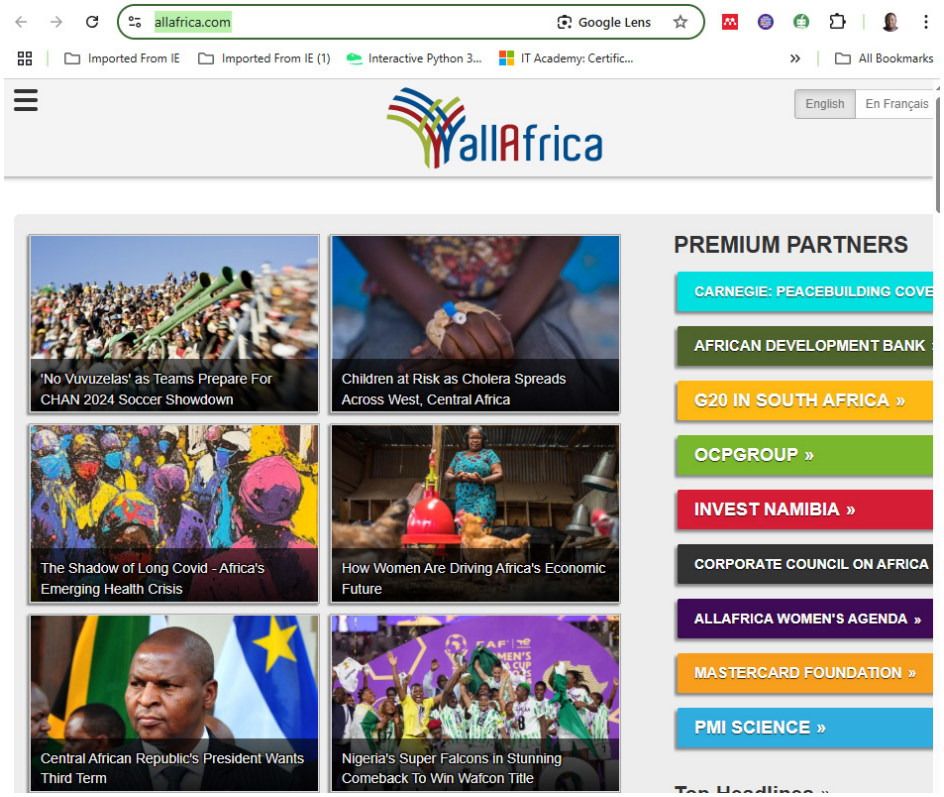


Figure 4.2: AllAfrica website: Provides news from across Africa, including business, politics, and regional updates. (Click Link to visit site)

E-Commerce Websites

This is a website that lets individuals purchase and sell goods, services, and digital products over the internet rather than at a physical store. An organisation can use an e-commerce website to handle orders, receive payments, manage shipping and logistics and provide customer care. They often contain '.com' at the end, where com

means 'commercial'. An example is https://cardsonlinegh.com/ (Where WAEC results checker cards and placement cards are sold). Other examples include: https://jumia.com, https://tonaton.com, etc.

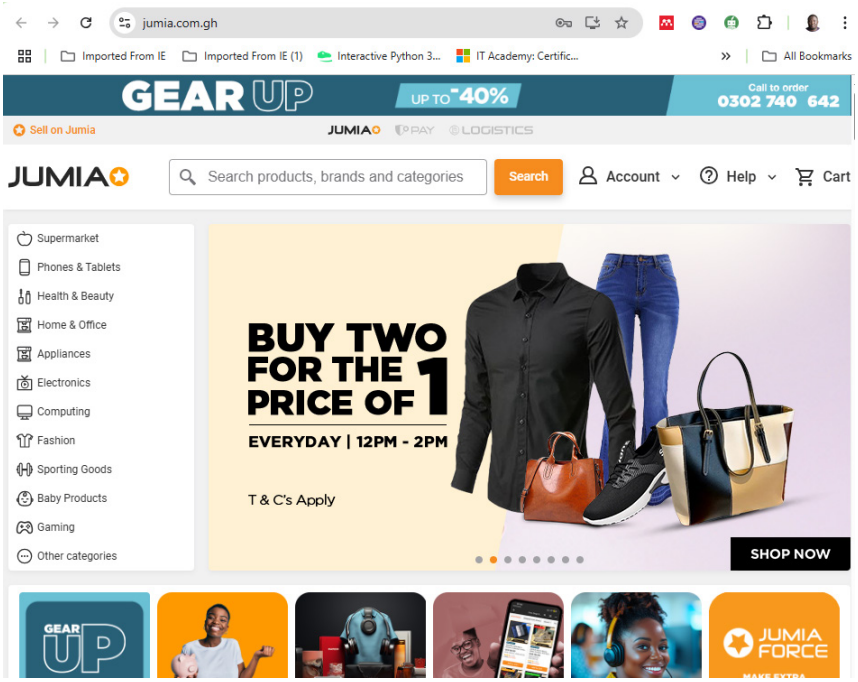


Figure 4.3: Jumia Website

Social Media Websites

The main purpose of these platforms is to connect people, share content (photos, videos, text) and build communities. Examples include Facebook, Instagram, YouTube, Twitter (X), TikTok, Snapchat, Telegram, WhatsApp, etc. While often used for social interaction, these platforms can also be powerful tools for educational groups, sharing academic resources and engaging in discussions. However, learners must be mindful of distractions and responsible online behaviour.



Figure 4.4: Social media websites

Entertainment Websites

a. **Purpose:** These websites provide media content for entertainment, such as movies, TV shows, music, and games.

b. **Key Features:** Streaming videos, music playlists, movie recommendations and user comments.

c. **Examples:**

- **YouTube:** A platform for user-uploaded videos across a wide variety of categories including entertainment, tutorials, and vlogs. (www.youtube.com)

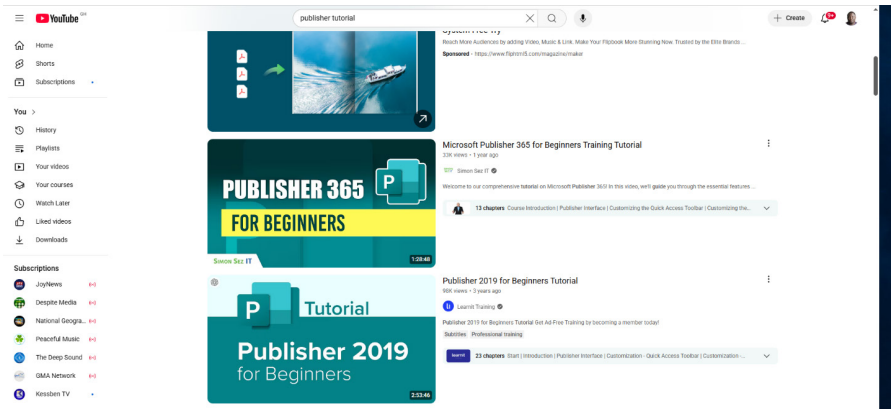


Figure 4.5: Example of Social Media Platform

Portfolio Websites

a. **Purpose:** These websites showcase an individual's or organisation's work and achievements. They are commonly used by creative professionals.

b. **Key Features:** Galleries, project descriptions, contact forms and professional background information.

Examples: Behance: A platform where designers, artists and creative professionals can showcase their work. (Visit Behance - https://www.behance.net/)

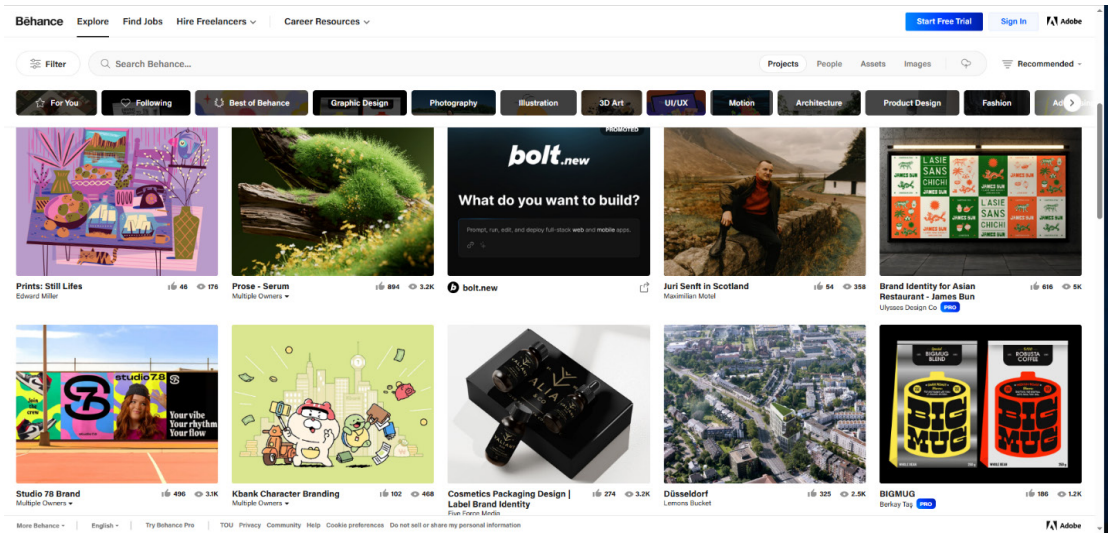


Figure 4.6: Example of Portfolio Website

Blogs And Forums

a. **Purpose:** Blogs share personal opinions, experiences and updates on a variety of topics. Forums allow users to engage in discussions on specific subjects.

b. **Key Features:** Posts, comments, discussion threads, categories and social sharing buttons.

c. **Examples:** WordPress: A popular platform for creating and hosting blogs.

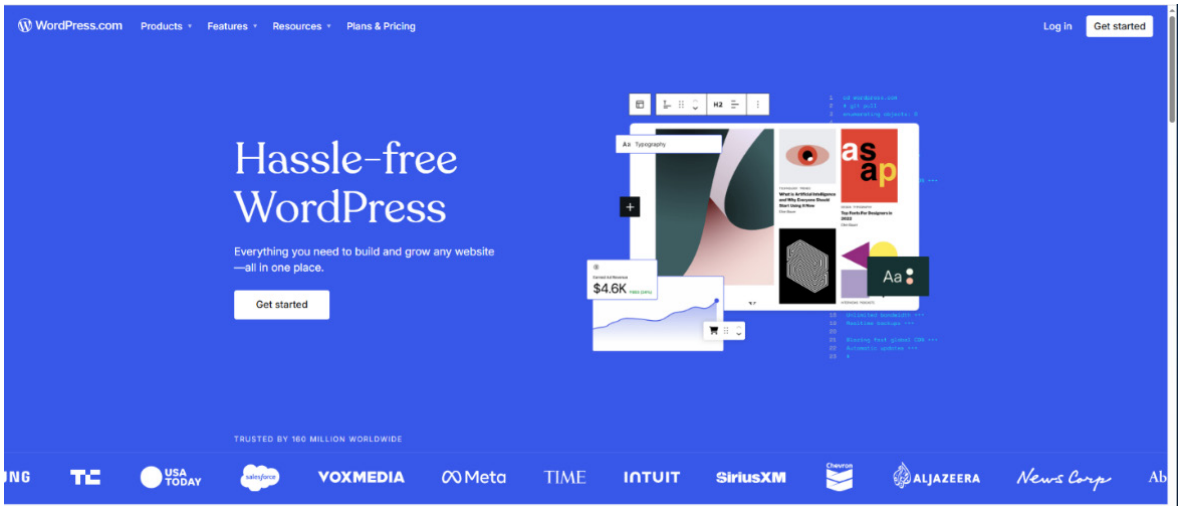


Figure 4.7: Example of Blog and Forum

News Websites

a. **Purpose:** Provide up-to-date news coverage on global events, politics, sports and more.

b. **Key Features:** Articles, breaking news updates, video content and sometimes live coverage.

c. **Examples:** Pulse Ghana: A leading Ghanaian news website covering politics, entertainment and sports. (visit https://www.pulse.com.gh)

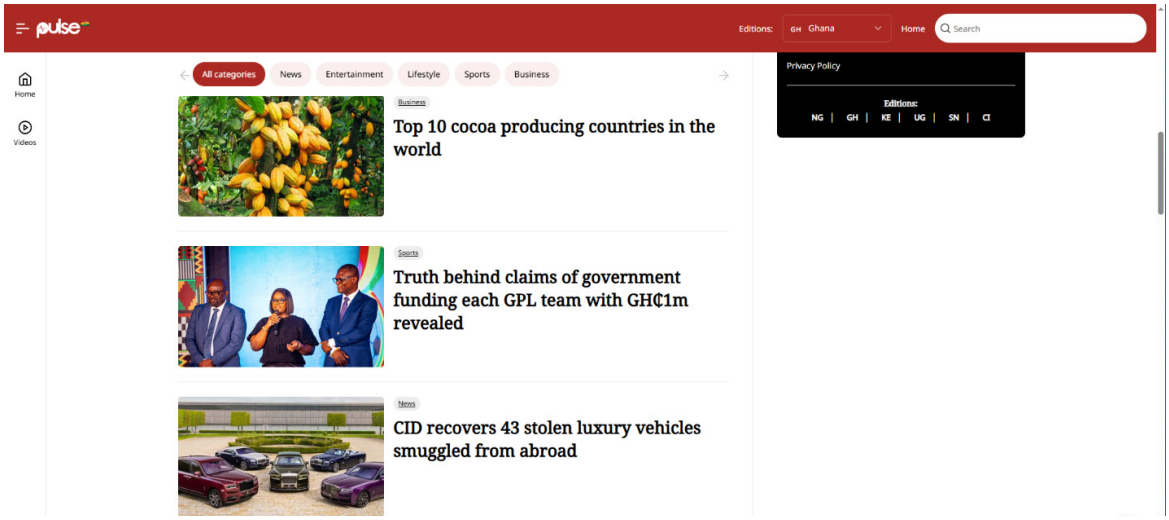


Figure 4.8: Example of News Website

Educational Websites

An educational website is designed to help learners learn in a fun and interesting way. They often include games, videos and other learning materials that support what is taught in the classroom, making learning more exciting and easier to understand.

Some examples are Ghana Learning Passport, Edmodo and other local platforms that help learners prepare for exams like BECE and WASSCE by providing past questions and tutorials. International sites like Khan Academy, Coursera, Duolingo and BrainPop also offer useful learning resources. Many universities in Ghana also have their own e-learning portals for learners.

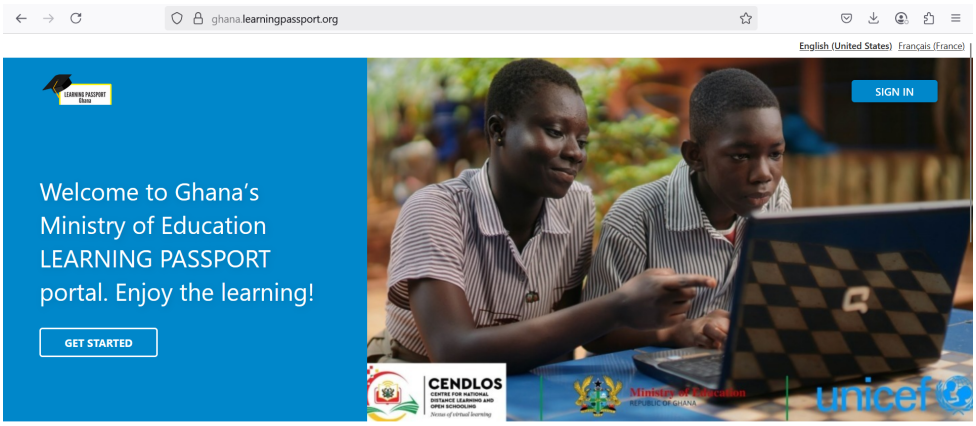


Figure 4.9: Example of Educational Website

Activity 4.2 Exploring Educational Websites

This activity will enable you to explore the contents of educational websites.

1. Visit an educational website (e.g., Ghana Learning Passport or Khan Academy).
2. Write a short paragraph (5–6 sentences) describing:
   a. What you learned from the site.
   b. What types of digital media were used, and how they helped you to understand the content?

NON-PROFIT/NGO WEBSITES

1. **Purpose:** Represent non-governmental organisations and charitable causes, focusing on social good, donations and advocacy.
2. **Key Features:** Donation forms, event listings, volunteer opportunities and mission statements.

3. **Examples: World Vision Ghana:** A child-focused charity organisation dedicated to improving lives in Ghana.

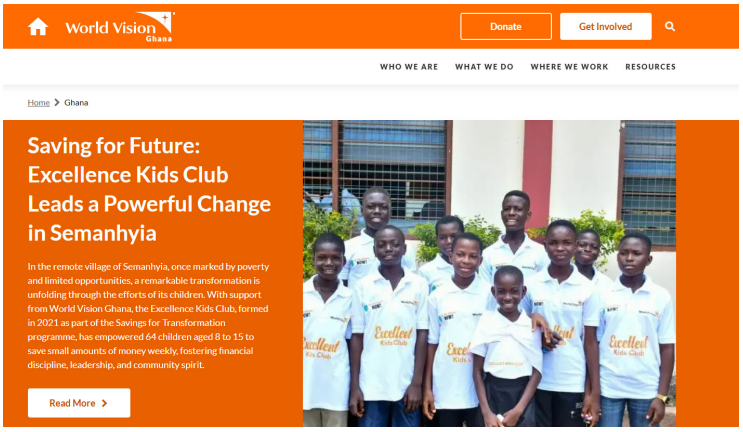


Figure 4.10: Example of Non-Profit/NGO Website

Corporate Websites

1. **Purpose:** Provide information about a business, its services, products and mission.
2. **Key Features:** Company history, product/service listings, customer support and contact information.
3. **Example: Bank of Ghana:** A major financial institution offering banking services in Ghana.

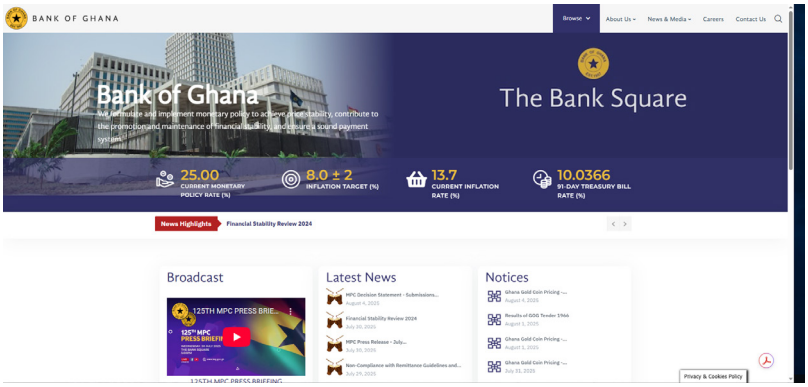


Figure 4.11: Example of Corporate Websites

Digital Media on the Web

Now, let us dive into the various digital media that websites use to enhance user experience:

a. **Graphics**

   i. **Purpose:** Graphics are essential for visual appeal and are often used to highlight content or make a website aesthetically pleasing.

   ii. **Examples:** Infographics, logos, illustrations and icons.

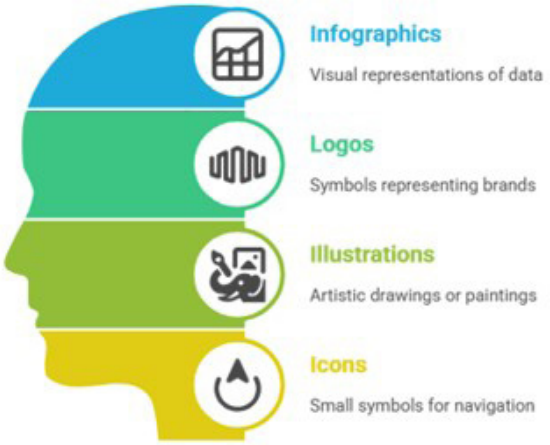


Figure 4.12: Elements of Visual Appeal

b. **Audio**

i. **Purpose:** Websites use audio for podcasts, music and sound effects, providing a richer user experience.

ii. **Examples**

Mdundo: A social platform for music streaming that focuses on African music and artists.

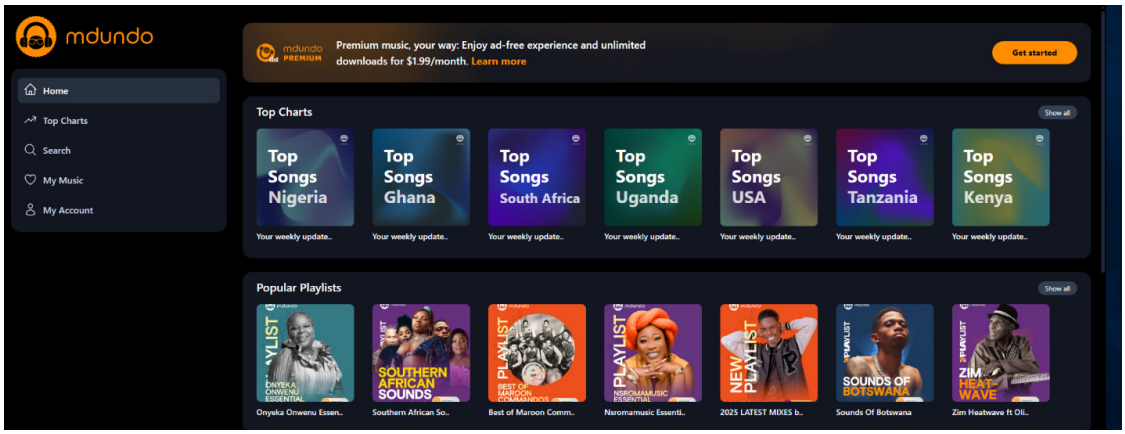


Figure 4.12: Audio Platform

c. **Video**

i. **Purpose:** Videos are increasingly used to engage users, explain complex ideas or entertain.

ii. **Examples:** YouTube (Video-sharing platform), DSTV Now: Streaming platform offering live TV and video content in Africa.

d. **Plug-ins**

i. **Purpose:** Plug-ins enhance the functionality of a website, adding features like media players, interactive forms and more.

ii. **Examples:** Yoast SEO: A popular plugin for search engine optimisation on WordPress sites.

The Importance of Digital Media in Website Design

1. Engagement: Digital media like images, audio and videos keep visitors engaged.
2. Communication: Graphics and videos make it easier to convey complex ideas quickly.
3. User Experience: A combination of digital media enhances the overall experience by making a website visually appealing and interactive.

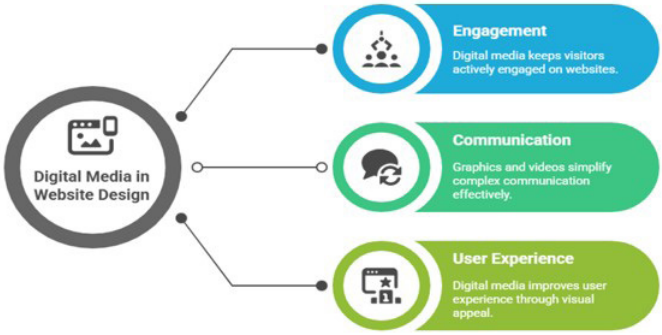


Figure 4.13: Impact of Digital Media

Activity 4.3 Exploring and Presenting Website Types and Digital Media

This activity will help you to explore and understand the different types of websites and the role of digital media (e.g., graphics, audio, etc) in enhancing user experience.

1. Organise yourself into a group of 3-5 people.
2. Write the name or URL of a website.
3. Explore any one type of website (e.g., informational, e-commerce, etc.) and examine how digital media (graphics, audio, video) is used to enhance the user experience.

   Note: You can use available resources or discuss websites you are familiar with.
4. Identify and take note of the digital media elements used: What types of graphics are used? (e.g., images, logos, banners), What types of audio can you find? (e.g., background music, podcasts), What kind of videos are included? (e.g., product videos, tutorials)
5. Analyse how these digital media elements help to achieve the website's purpose (e.g., do videos help explain products or services? Do graphics make the site more visually appealing?).
6. Discuss your findings about the digital media on the website you explored.
7. Collaborate and share ideas: How do graphics contribute to the website's design and purpose? In what ways does audio enhance user interaction with the website? how do videos help in conveying important information or encouraging user actions?

8. Support each other by providing suggestions and ideas on how digital media can be used effectively across different website types.
9. Present your findings to the class.
10. Discuss any challenges you encountered while exploring the website.
11. Reflect on your group's presentation and the feedback you received.
    a. What insights did you gain from other groups' presentations?
    b. How did digital media enhance your understanding of the different website types?
    c. Did you discover any new ideas on how to use graphics, audio or videos effectively in a website?
12. Provide constructive feedback to other groups on their findings and share how their exploration might influence your future use of digital media in web design.

Plug-ins (Browser Extensions/Add-ons)

What are Plug-ins?

Plug-ins, also known as browser extensions or add-ons, are small software programs that add specific functionality or enhance features in web browsers like Google Chrome, Mozilla Firefox, Microsoft Edge or Opera. These plug-ins are not installed onto a website but are installed into the browser itself to improve how users interact with the web.

Key Functions of Plug-ins/Add-ons



Figure 4.14: Plug-in Functionalities

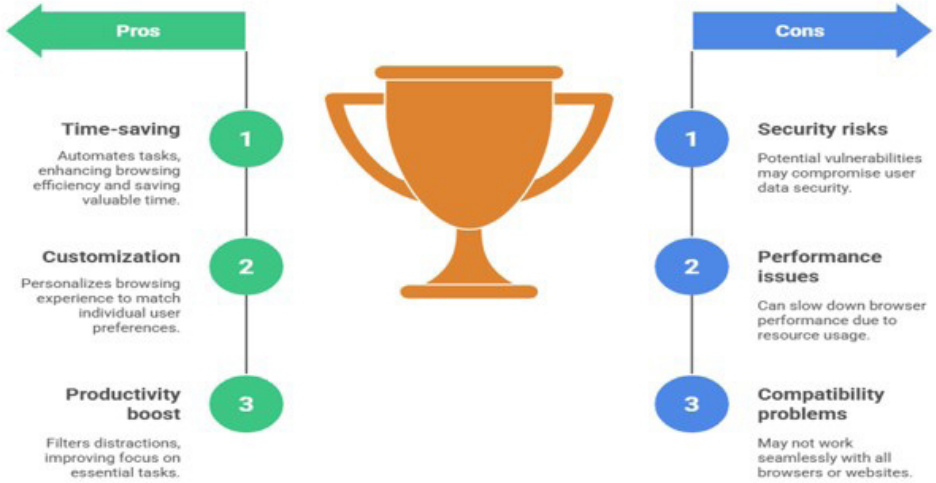


Figure 4.15: Browser Plug-ins: Pros and Cons

Considerations

1. Always install reputable plug-ins. Some plug-ins can compromise your privacy or security if they are not from trusted sources.
2. Be cautious about too many plug-ins: Installing too many can slow down your browser and impact performance.

Videos on the Web

What Are Videos On The Web?

Videos are moving visual content, often accompanied by audio and are widely used on the internet. They can be in different formats, including MP4, MOV, WMV and FLV. Videos are powerful tools that can effectively convey information by combining sight and sound. They offer a dynamic and engaging experience, especially when demonstrating complex processes or providing visual explanations.



Figure 4.16: Roles of Videos on Websites

Video Formats

1. **MP4:** The most widely used video format due to its balance between quality and file size. It's compatible with most devices and browsers.
2. **MOV:** Popular on Apple devices and for editing in software like Final Cut Pro.
3. **WMV:** A Windows-based format, less common now, but still used for specific purposes.
4. **FLV:** Flash video format, often used in the past but now outdated with the rise of HTML5 video.

Video Platforms

1. **YouTube:** A global video-sharing platform, offering videos on nearly every topic imaginable, including academic enrichment for learners.Visit YouTube
2. **Vimeo:** Another video-sharing platform, known for hosting high-quality, professional videos.

   Visit Vimeo

Why Videos Are Effective

1. Dynamic Learning: Learners, including those in Ghana and across Africa, often rely on platforms like YouTube to access tutorials and educational content in subjects ranging from science to technology.
2. Increased Engagement: Studies show that people are more likely to retain information presented in video format than through written text alone.

Audio on the Web

What Is Audio On The Web?

Audio content on websites includes sound elements such as spoken word, music, sound effects and podcasts. Audio offers a different sensory experience compared to text and video. It is particularly useful for delivering content while users are on the move or doing other activities, such as walking or cooking.

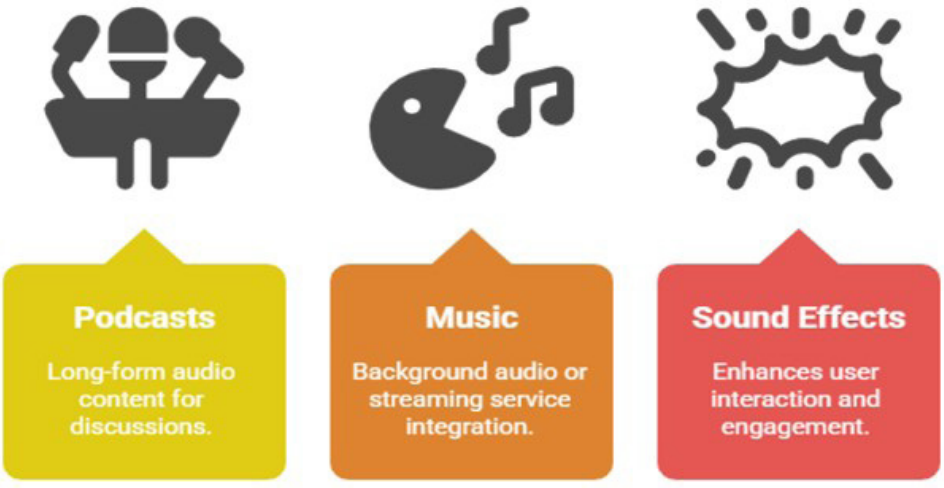


Figure 4.17: Audio Content Types

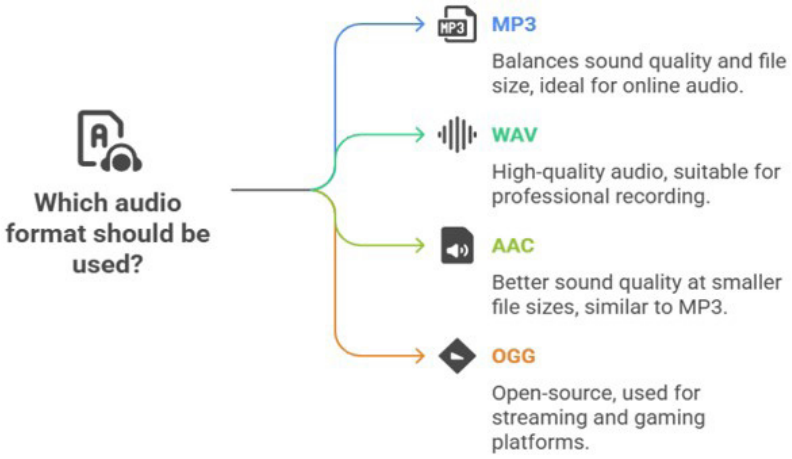


Figure 4.18: Audio Formats

Audio on Platforms

a. **SoundCloud:** A popular audio streaming platform for music and podcasts, often used by emerging artists in Ghana and Africa to share their music with a global audience.

   Visit SoundCloud

b. **Spotify:** A streaming service providing a massive library of music and podcasts. Visit Spotify.

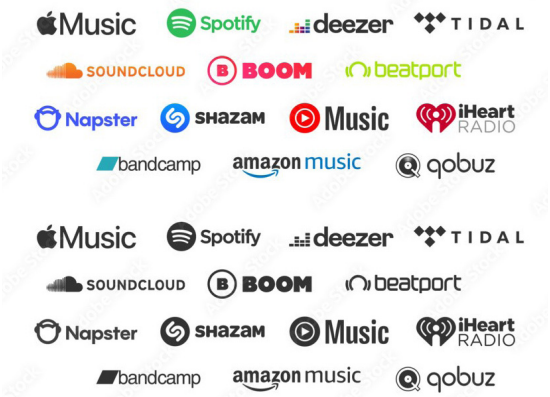


Figure 4.19: Audio on platforms

Why Audio Content Is Important



Figure 4.20: Importance of Audio Content

Basic Structure of a Website and the Role of HTML, CSS and JavaScript

Understanding how websites are built is crucial in web development. The structure of any website generally involves three main technologies

1. **HTML (Hypertext Markup Language)**

Role: HTML is the foundation of a website. It defines the structure of web pages, including headings, paragraphs, images, links and other content elements.

Key Features: HTML uses tags to define different sections of content. For example, <h1> defines a main heading and is used for paragraphs.

Example: A simple webpage with a heading, paragraph and image might look like this in HTML:

<html>

<body>

<h1>Welcome to My Website</h1>

This is a paragraph of text.

<img src=”image.jpg” alt=”An image”>

</body>

</html>

2. **CSS (Cascading Style Sheets)**

Role: CSS is used to style and layout HTML content. It controls the appearance of a website, including colours, fonts, spacing and positioning.

Key Features: CSS allows you to make a website visually appealing by adjusting the design. For example, you can change the background colour, set font sizes and arrange content in columns.

Example: A CSS rule to change the background colour and font size might look like this:

body {

background-colour: light blue;

font-size: 16px;

3. **JavaScript**

Role: JavaScript is used to create interactive elements on a website. It enables functionality such as form validation, animations and handling user interactions.

Key Features: JavaScript allows the website to respond dynamically to user input, such as clicking a button or submitting a form.

Example: A simple JavaScript function to display an alert when a button is clicked:

<button onclick=”alert (‘Hello, World!’)”>Click Me</button>

Activity 4.4 Evaluating the Interactivity of Websites

This activity will enable you to evaluate the interactive elements of a website, focusing on videos, audio and plug-ins and present your findings to the class.

1. Organise yourself into a group of 3 to 4 people.
2. Select a website to evaluate its interactive features, specifically focusing on the use of:
    a. Videos: Are videos integrated into the website? How do they enhance interactivity?
    b. Audio: Does the website include audio elements? If so, how are they used to improve the user experience?
    c. Plug-ins: Are there any plug-ins (such as media players, forms or interactive tools) that enhance the website's functionality?
3. Explore the chosen website and assess its interactivity. Pay close attention to how the videos, audio and plug-ins contribute to the website's user experience.
    a. Are the videos easy to access, relevant to the content, and do they play smoothly?
    b. Is the audio clear, helpful and properly integrated (e.g., background music, voiceovers)?
    c. Are the plug-ins functional and user-friendly (e.g., forms, chatbots, interactive galleries)?
4. Document your observations on how these elements make the website more engaging and note any challenges or limitations you encountered.
5. Present your group's findings to the class.
6. Engage in a whole-class discussion:
    a. What makes the interactive elements on a website effective?
    b. How can websites improve their interactive features (e.g., better integration of media, smoother plug-ins)?
    c. What types of websites would benefit the most from using videos, audio and plug-ins?
7. Reflect on the feedback you received from your peers and the teacher during the presentation.
8. Consider the points raised about improving interactivity and think about how you could apply these insights to your own future website design or evaluation.

GENERAL ACCESSIBILITY PRINCIPLES

Accessibility refers to the practice of designing websites and digital content so that everyone, including people with disabilities or limited digital access, can use and understand the content.

In Ghana, this is especially important because;

1. Internet access can be unstable and slow.
2. Devices such as smartphones are more commonly used than computers.
3. Physical abilities and digital literacy vary widely.

Why Accessibility Matters

1. It helps learners with visual or hearing impairments engage with educational content.
2. It supports those using basic phones, slow internet or older devices to access online materials.
3. It ensures that everyone, regardless of location or ability, has equal access to learning content.

Key Accessibility Considerations by Media Type

Consider the following accessibility considerations for different types of digital media.

Graphics (Images and Charts)

Graphics, such as images and charts, are essential for engaging users. However, they can pose challenges for users with visual impairments or low internet bandwidth.

Key Considerations

1. **Use Alternative Text (Alt Text)**
    a. Always provide a short description of the image for screen readers to read aloud for users who are blind or visually impaired.
    b. Example: An image of the water cycle could have alt text like - “Diagram showing water evaporation, condensation and rainfall.”
2. **Avoid Text in Images**
    a. If you place text inside an image (such as a poster or banner), also write the same message as normal text on the website. This ensures it is accessible to screen readers and users with low vision.
3. **Use High-Contrast Colours**
    a. High contrast between text and background helps users with low vision see images and charts clearly.
    b. Example: Use dark text on light backgrounds or light text on dark backgrounds.

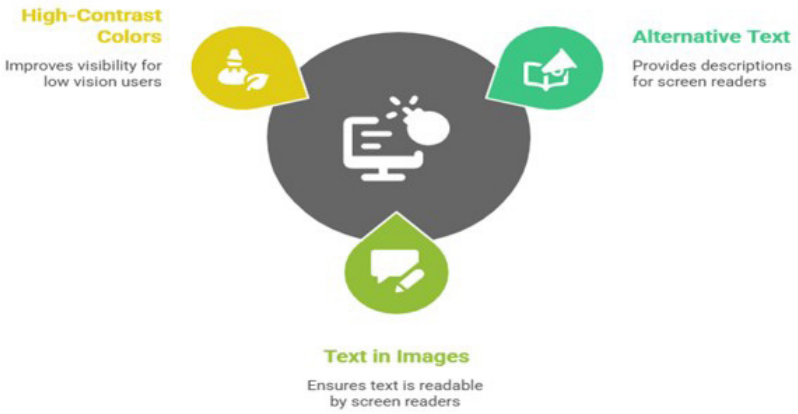


Figure 4.21: Enhancing Digital Accessibility

Audio

Audio content, such as podcasts, voice notes or music, provides an engaging way to learn, but it may not be accessible to all users, especially those with hearing impairments or limited access to audio devices.

Key Considerations

1. **Provide Transcripts**
    a. Always include a written version of audio files (e.g., voice notes, music, spoken lessons) so users who cannot hear or those with poor audio devices can follow.
    b. Example: Asante Twi audio lessons should have English translations or transcripts.
2. **Avoid Autoplay**
    a. Let users choose when to play audio, especially for those using limited data or who are in shared spaces (e.g., classrooms, libraries).
    b. This avoids unnecessary data usage or disruptions for users in quiet environments.

Video

Videos combine sight and sound to convey information effectively. However, they can present challenges for individuals who are deaf or hard of hearing or those in environments with poor internet connections.

Key Considerations

1. Add Captions or Subtitles
    a. Ensure that all videos include captions or subtitles for learners who are deaf or hard of hearing and for those in noisy environments.
    b. Example: A science video on photosynthesis should have subtitles.

2. Offer Lower-Quality Download Options: Provide lower-quality video options for learners with slow internet or expensive data connections, ensuring that they can still access the lesson without excessive buffering.
3. Provide a Text Summary: In case a video cannot load due to poor internet, provide a written summary of the key points. This will help users catch up on the content if they are unable to watch the video.

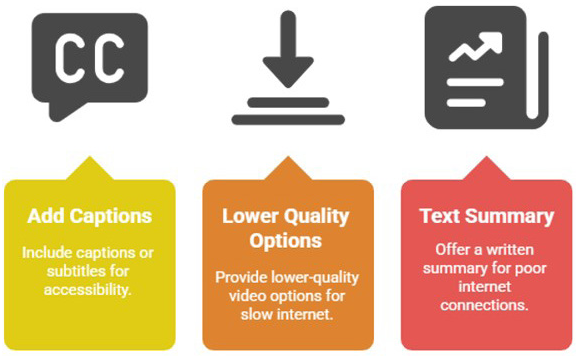


Figure 4.22: Key Considerations when using Video

Plug-ins (e.g., Online Quizzes, Interactive Content)

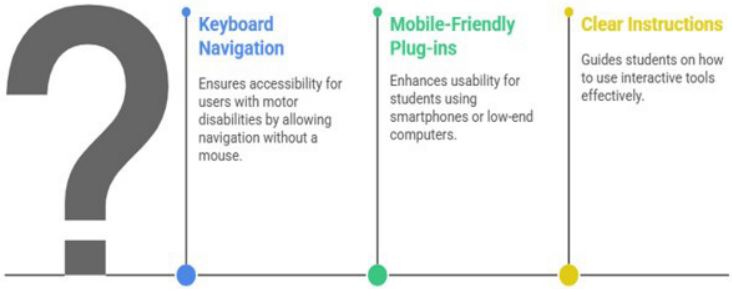


Figure 4.23: Plug-ins Key Considerations

Plug-ins (or browser extensions) are small software programs that enhance a website's functionality. However, these can be challenging for users with motor disabilities, those who rely on assistive technologies or those using older devices.

Activity 4.5 Understanding general accessibility principles

Click on this link to watch a video tutorial that will help you understand general accessibility principles.

1. After watching the video, note one example each of how audio, video or graphics can be made accessible.
2. Brainstorm on how these accessibility principles might map onto different types of websites (e.g., educational, e-commerce, news portals)
3. Share your views with a colleague.
4. Reflect on the feedback from the discussion.

ACCESSIBILITY IN THE GHANAIAN CONTEXT

When designing websites or creating content, it is important to consider the following aspects in the context of Ghanaian schools.

1. **Unstable Internet**
    a. Provide downloadable or offline options for content. This allows learners to access materials even if they have poor or no internet connection.
    b. Example: Provide PDFs of study materials or offline audio files.
2. **Limited Devices**
    a. Design websites with a mobile-first approach, as most learners in Ghana use smartphones for accessing the internet.
    b. Example: Use a responsive design that adapts to different screen sizes.
3. **Low Digital Literacy**
    a. Simplify website interfaces and content so they are easy to understand and use, especially for learners with limited experience using technology.
    b. Example: Use clear buttons and basic instructions for navigation.
4. **Language Barriers**
    a. Where possible, translate content into local languages such as Twi, Ga, Ewe or Fante or provide English translations for learning resources.
    b. Example: Translate lesson content into multiple local languages to cater to a wider audience.

Understanding Copyright and Licensing in Multimedia

What Is Copyright?

Copyright is a legal right given to the creator of original work (like music, videos, photos or designs). It gives the creator the exclusive right to:

1. Copy
2. Share
3. Modify
4. Sell their work

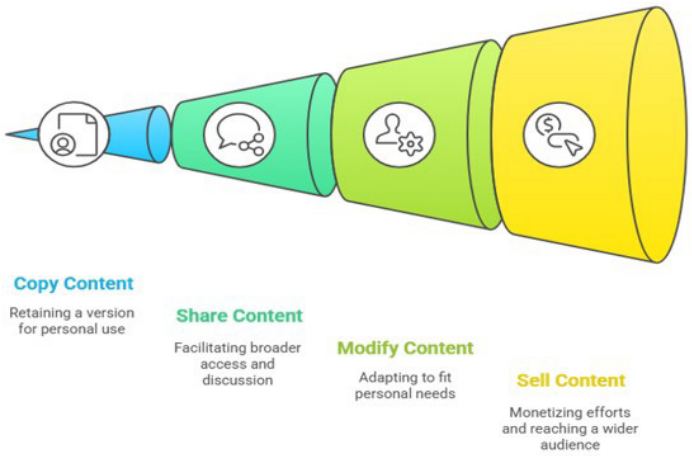


Figure 4.24: Creative Content Engagement

Copyright protects multimedia content on the web, including:



Figure 4.25: Multimedia Content Protected by Copyright

What Happens if You Use Content Without Permission?

Using copyrighted content without permission is called infringement. Infringing content can lead to:



Figure 4.26: Consequences of Plagiarism

What is Licensing?

Licensing is when the copyright holder gives others legal permission to use their work, often with certain conditions.

Table 4.1: Types of Licenses You Should Know

License Type	What It Means	Can You Use It for School Projects?
All Rights Reserved	You cannot use it unless you ask for permission.	❌ No, unless you get permission.
Creative Commons (CC)	Free to use, but with rules like giving credit.	✅ Yes, with proper credit.
Public Domain	Free to use with no restrictions.	✅ Yes, freely.
Royalty-Free	Can be used without paying each time, but may have a fee.	✅ Sometimes, depending on terms.

Practical Tips for Learners

Learners should always follow these Dos and Don'ts

Dos

1. Use content from websites that provide free-to-use educational media, such as:
    a. Pixabay (for images, video and audio) Visit Pixabay
    b. Pexels (for images) Visit Pexels
    c. Freesound.org (for audio) Visit Freesound.org
    d. YouTube Creative Commons (for videos) Visit YouTube Creative Commons
2. Always give credit to the creator if a license requires it.
3. Ask for permission if you are not sure.

Don'ts

1. Copy music, movies or images from Google or social media without checking the license.
2. Use someone's voice or video clip in your project without their permission.
3. Remove watermarks or claim others' work as your own.

As you create your own projects, always keep these considerations in mind to ensure your work is both accessible and legally compliant.

Activity 4.6 Evaluating Website Accessibility and Copyright

This activity will help you to understand the accessibility considerations, copyright laws and licensing conditions related to websites and educational documents.

1. Briefly explain the importance of copyright laws and licensing conditions in ensuring fair and legal use of online content.
2. Discuss the concept of copyright and licensing, including how they protect creators' intellectual property and dictate usage rights as well as website accessibility.
3. In your groups of 3 – 4, click on this link to view a website and evaluate it based on accessibility considerations and copyright conditions.
    a. Accessibility: Is the website easy to use for people with disabilities (e.g., does it provide text-to-speech, screen reader compatibility, clear navigation)?
    b. Copyright: Are there any copyright or licensing notices on the website (e.g., "All rights reserved", terms of use for content)?
4. Visit another website using your device (e.g., tablet).
    a. Look for accessibility tools (like high contrast settings or language options) and evaluate the site's user-friendliness.
    b. Check for copyright information, usually in the footer or in a Terms of Use or Privacy Policy section
5. Discuss your findings within your group.
6. Share your thoughts with each other on whether the website meets accessibility standards and the nature of the copyright or licensing information you found.
7. Present your findings, with each group member taking turns to explain different aspects of the evaluation.
8. Summarise key points in your books about how accessibility and copyright considerations contribute to ethical and legal web usage.
9. Reflect on the feedback you received from your peers.
10. Consider how the evaluation of accessibility and copyright can influence your future use of websites and educational resources.

EXTENDED READING

- Big Guide to Different Types of Websites — Design4Users
- Evaluating Web Accessibility Overview | Web Accessibility Initiative (WAI) | W3C
- https://www.freecodecamp.org/news/html-css-and-javascript-the-front-end-trifecta/



- https://developer.mozilla.org/en-US/docs/Web/HTML/Element/video



- https://wordpress.org/support/article/plugins/



- https://www.sitepoint.com/types-of-websites/



- https://www.digitaltrends.com/entertainment/digital-media/



REVIEW QUESTIONS

1. What are plug-ins, and how do they enhance the functionality of a website? Give an example of a plug-in commonly used on websites.
2. Describe the roles of HTML, CSS and JavaScript in the structure and functionality of a website. How do these technologies work together to create a seamless user experience?”
3. How does digital media, such as images or videos, enhance the design and functionality of a website, such as an online store?
4. What are some key principles of general accessibility that should be considered when designing a website or digital content?
5. Explain how copyright and licensing influence the use and sharing of multimedia content on websites. How would you ensure you follow proper licensing procedures when using content from the internet?

SECTION

5

DEVICES FOR NETWORK SYSTEMS



Network Systems for Transmitting Information

Guided and Unguided Network Systems

INTRODUCTION

In your previous sections, you have seen how a network plays a vital role in connecting people, devices and information. To make these connections possible, several network devices are used. These devices help in transmitting, directing and managing data within a network. For example, when you connect to the internet using a phone or computer, devices like routers, switches and modems make this possible. Understanding how these devices work is important for you as a learner, especially in a technology-driven society like ours. In this section, you will explore some commonly used network devices, their functions and how they help create and manage computer networks. This knowledge will help you understand how data travels from one device to another and how networks operate in schools, offices and homes.

KEY IDEAS

- **Definition of network devices:** What network devices are and their role in data communication.
- **Differences among devices:** Comparing devices based on their roles and how they operate.
- **Functions of each device:** Exploring how each device supports communication within a network.
- **Practical Examples:** Observing how these devices are used in real-world settings like homes, schools and offices.
- **Types of commonly used network devices:** Identifying key devices such as routers, switches, hubs, modems and access points.
- **Wired vs. wireless devices:** Understanding how connectivity types affect device use.

TRACING THE DIGITAL PATH

Activity 5.1 Tracing the digital path

This activity will start with your past knowledge on how websites are accessed and how network communication works, in order to understand the devices that make these connections possible.

1. How do you access a website like www.google.com from your device?
2. List some key elements involved in navigating a website (e.g., hyperlinks, internet, etc)
3. Draw a simple diagram of a device (e.g., smartphone or computer) accessing a website and suggest what components are involved in making this happen.
4. What does TCP/IP stand for?
5. How is data sent across a network?
6. What devices must be present for a school to connect all its computers to the internet?

Commonly used network devices

A network device is a hardware or software component that allows computers and other electronic devices to connect to a network and exchange information. These devices help control the flow of data, ensure network security, and support the sharing of resources such as printers and internet access. Common examples of these devices include: broadband, modems, wireless access points, routers, pfSense, Cisco Packet Tracer, hubs and switches.

Broadband devices

Broadband devices allow multiple users to connect to the internet at the same time and enjoy faster speeds for activities like browsing, streaming, downloading and online learning. Examples include; Modems, broadband routers and fibre optic terminals.

Modem (Modulator-Demodulator)

A modem is essential for converting digital data from your computer into signals that can travel through phone lines, fibre-optic cables or cable systems. There are various types of modems, each with its own advantages.



Figure 5.1: Modem

Types of Modems

1. **DSL Modem:** Connects to a phone line

Advantages

a. Availability: Widely available and used in areas with existing phone lines.

b. Speed: Good for typical home usage, such as browsing and streaming in standard definition.

c. Affordability: Generally, less expensive compared to other types of modems.

2. **Cable Modem:** Connects to a TV cable

Advantages

a. Faster Speeds: Offers higher speeds than DSL modems, making it suitable for activities like HD video streaming, gaming and downloading large files.

b. More Reliable: More reliable for households or offices needing a constant internet connection.

c. Availability: Best suited for areas with cable TV infrastructure.

3. **Fibre Modem:** Connects to fibre-optic internet

Advantages

a. Super-Fast Speeds: Fibre-optic modems provide the fastest internet speeds, making them ideal for high-demand activities like 4K video streaming, cloud computing and large file transfers.

b. Future-Proof: As fibre technology improves, it can handle increasingly high internet usage.

c. Low Latency: Fibre internet tends to have low latency, which improves online gaming and real-time applications.



Figure 5.2: Modem Type Comparison

Router

A router connects multiple devices to the internet through a modem and directs the data traffic between them. It comes in different forms and functionalities depending on the needs of the network.



Figure 5.3: Routers

Types of Routers

1. **Wired Routers**

Advantages

a. Stable Connection: Wired connections are more stable than wireless, offering less interference.

b. Security: More secure as data is transmitted via physical cables, reducing the risk of eavesdropping.

c. Speed: Wired connections typically provide faster speeds compared to wireless connections.

2. **Wireless Routers**

Advantages

a. Convenience: Devices like smartphones, tablets and laptops can connect wirelessly, providing mobility within the home or office.

b. Multiple Device Support: They can handle a variety of devices at once without the need for physical connections.

c. Ease of Setup: Wireless routers are easy to set up and do not require cables, which makes them ideal for users who want simple installations.

3. **Mesh Routers**

Advantages

a. Wide Coverage: Mesh routers are perfect for larger homes or offices as they cover a bigger area by using multiple access points (nodes).

b. Seamless Connectivity: They provide a seamless connection as users move around, without having to switch networks.

c. Improved Speed and Performance: Better speed and performance over long distances, eliminating "dead zones" in the Wi-Fi coverage.

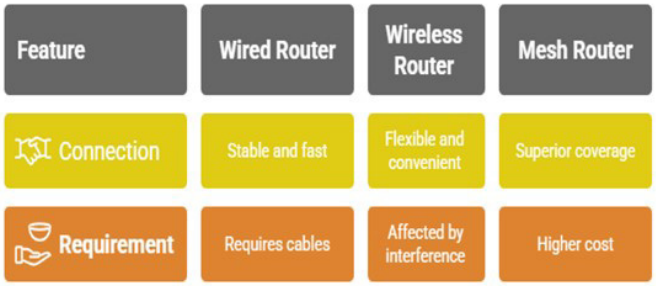


Figure 5.4: Router Types Comparison

Wireless Access Point (WAP)

A Wireless Access Point (WAP) is a networking hardware device that allows Wi-Fi enabled devices (like smartphones, laptops, tablets) to connect to a wired network. Think of it as a central hub that broadcasts a wireless signal, enabling all nearby compatible devices to get online without needing physical cables.

Core Function

WAPs create a Wireless Local Area Network (WLAN), allowing devices to communicate wirelessly with each other and, crucially, to access the internet if the WAP is connected to a broadband router.

How it Works

A WAP is typically connected via an Ethernet cable to a router (which brings the internet connection from an Internet Service Provider, ISP) or a network switch within an organisation.



Figure 5.5: Wireless Access Point (WAPs)

Types of WAPs

Integrated WAPs (in Home Routers)

This is the most common type of WAP a learner would encounter at home. Most standard home Wi-Fi routers (provided by ISPs like Telecel Broadband, MTN, AT or when you buy a general Wi-Fi router) have a built-in WAP function. These devices combine a router, a WAP and often a switch in one unit.

They provide Wi-Fi for all devices within a typical home or small office environment.

Advantages

a. Cost-Effective: Since they are integrated into home routers, they eliminate the need to buy a separate WAP.

b. Simplicity: Easy to set up, with fewer devices involved in the network setup.

c. Convenience: Provides Wi-Fi coverage for a typical home without the need for additional equipment.

Standalone WAPs

These are dedicated devices solely designed to provide Wi-Fi access. They do not have routing capabilities themselves but connect to an existing router or network.

Often found in larger settings like schools, universities, hotels or large businesses. Multiple standalone WAPs are strategically placed to ensure strong Wi-Fi coverage across many rooms or large areas.



Figure 5.6: Standalone WAP

Advantages

a. Stronger Coverage: Used in larger settings like schools, hotels and businesses. They provide better coverage for larger areas compared to integrated WAPs.

b. Flexibility: Can be installed in specific locations to extend Wi-Fi coverage in areas that integrated routers cannot reach.

c. Scalability: More WAPs can be added to extend coverage without interfering with network performance.

Mesh Wi-Fi Systems

These involve multiple WAPs (often called 'nodes' or 'points') that work together to create a single, all-in-one Wi-Fi network across a larger area. They communicate with each other to extend coverage and improve signal strength.

Increasingly used in larger homes or educational institutions to eliminate Wi-Fi dead zones and provide consistent coverage throughout a building.



Figure 5.7: Mesh Wi-Fi Systems

Advantages

a. Continuous Coverage: These systems ensure consistent Wi-Fi coverage across larger homes or organisations by using multiple access points that work together.

b. No Interruption: Users experience no interruptions as they move between rooms or buildings, ensuring a smooth experience.

c. High Performance: Mesh systems can handle high traffic and multiple devices, ensuring fast and reliable speeds.

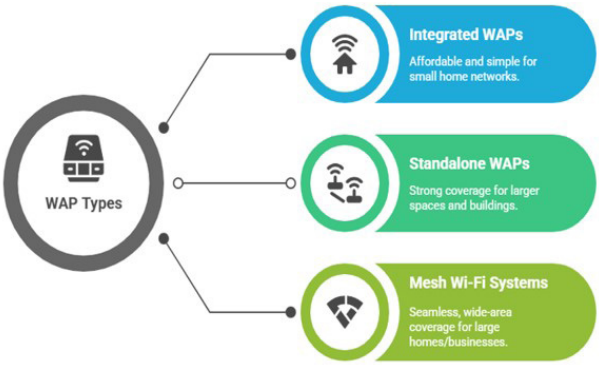


Figure 5.8 Advantages of WAP Types

Switch

A switch is a network device that connects multiple computers or devices in a network and helps them share information smoothly. It checks each data packet for errors before sending it to the right device. If the data has a problem, the switch does not send it. If the data is correct, the switch sends it only to the device it is meant for, not to all devices. This makes communication faster and more efficient. A switch also helps

reduce data traffic between devices by creating a separate path for each connection, but all devices still receive general messages sent to everyone on the network.



Figure 5.9: Switch

Table 5.1: Types of Switches

S/N	TYPE OF SWITCH	DESCRIPTION	ADVANTAGES	DIAGRAM
1	Unmanaged Switches	Simple plug-and-play switches with no advanced configuration options. Suitable for small networks or as an expansion.	Plug-and-Play: No setup required. Affordable: Ideal for small networks. Low Maintenance: Minimal upkeep required.	
2	Managed Switches	Switches with advanced configuration options like VLANs, QoS, and link aggregation are used for larger networks.	Advanced Configuration: Supports VLANs and QoS. Network Control: Full control over traffic management. Scalability: Ideal for large networks.	
3	Smart Switches	Switches offering some features of managed switches but easier to set up. Best for small-to-medium networks.	Balance of Features: Advanced features with easy setup. Cost-Effective: Ideal for medium-sized businesses.	
4	Layer 2 Switches	Operates at the Data Link Layer (Layer 2), forwarding data based on MAC addresses in a local network.	Simple and Fast: Faster due to Layer 2 processing. Efficient for LANs: Great for small networks. Reduced Collisions: Separate collision domains for each device.	

5	Layer 3 Switches	Operates at the Network Layer (Layer 3), routing traffic between different network segments or subnets.	Routing Capabilities: Routes traffic between subnets. Improved Efficiency: Reduces the need for separate routers. Scalability: Ideal for larger, complex networks.	
6	PoE Switches	Allows power and data to be transmitted over the same Ethernet cable to devices like IP cameras or phones.	Simplifies Wiring: Reduces the need for separate cables. Cost-Efficient: Lowers installation costs. Convenience for Remote Locations: Ideal for hard-to-reach places.	
7	Gigabit Switches	Supports Gigabit Ethernet speeds (1 Gbps), essential for high-speed data transfer in modern networks.	High-Speed Data Transfer: Ideal for high-bandwidth applications. Future-Proofing: Provides sufficient bandwidth for growing networks. Improved Performance: Reduces network bottlenecks.	
8	Rack-Mounted Switches	Designed to be mounted in server racks, ideal for large setups like data centres or enterprise networks.	Space-Saving: Saves floor space in large environments. Centralised Management: Easy access for maintenance. Scalability: Can be expanded easily.	
9	Desktop Switches	Compact switches for small networks like offices or home use, often placed on desks or tables.	Compact and Affordable: Great for smaller setups. Portability: Easy to move and flexible. Basic Functionality: Ideal for small networks.	
10	Modular Switches	Switches with modular components that can be added or removed to customise the switch based on network needs.	Customisable: Tailored to specific network needs. Scalable: Expands easily as the network grows. Future-Proof: Modules can be upgraded.	

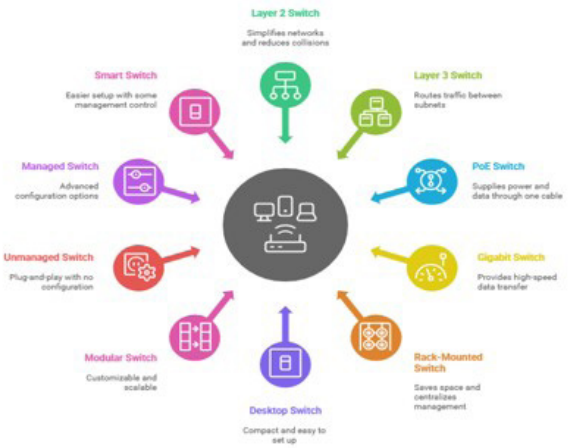


Figure 5.10: Switch Types Advantages

Hub

A hub is a basic networking device used to connect multiple devices within a network. It sends data to all devices connected to it, which can lead to inefficiency and slower speeds. It is also a significant security concern and, as such, would not typically be found installed in a modern network.



Figure 5.11: Hub

Table 5.2: Types of Hubs

S/N	HUB TYPE	DIAGRAM
1	**Active Hub**	
2	**Passive Hub**	
3	**Intelligent Hub**	

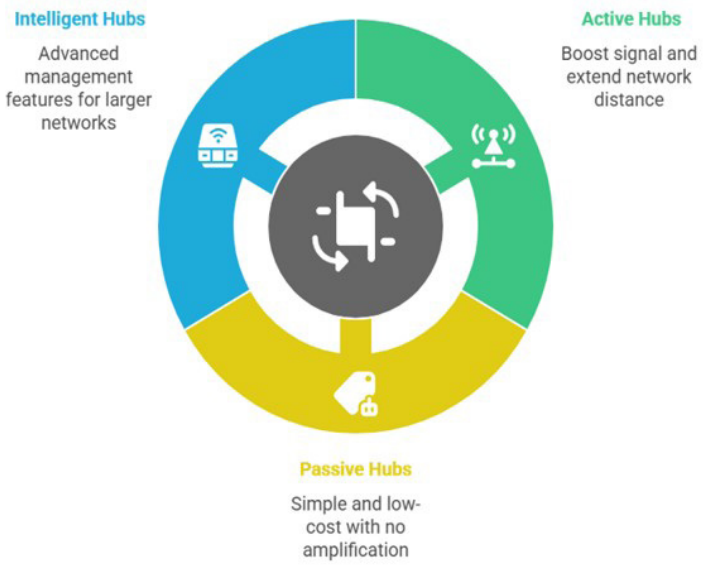


Figure 5.12: Advantages of Hub Types

MiFi (Mobile Wi-Fi Hotspot)

These are small, portable wireless devices that act as a personal Wi-Fi hotspot. They use a SIM card to connect to a cellular network (like a smartphone) and then broadcast a Wi-Fi signal, allowing multiple devices (laptops, tablets, other smartphones) to connect to the internet simultaneously.

It is good for learners learning online, in homes without fibre or fixed broadband. Popular brands in Ghana: MTN Mifi, Telecel MiFi, AirtelTigo Pocket WiFi



Figure 5.13: Samples of MiFi used in Ghana

Smartphones (as Hotspots)

For many Ghanaian learners, their smartphone is their primary and often only device for accessing the internet. These are versatile devices that combine a phone, a mini-computer and an internet access point.

Most smartphones can share their mobile data by creating a Wi-Fi personal hotspot. It is handy for students in areas without routers or modems and provides the quickest way to connect a laptop to mobile internet. Your phone can also act as a mini-MiFi device.

Activity 5.2 Exploring Networking Devices and Their Applications

This activity will deepen your understanding of key networking devices such as broadband, modems, wireless access points, etc.

1. Organise yourself into a group of 3 to 4 people.
2. Discuss the uses of the following networking devices.
   a. Broadband
   b. Modems
   c. Wireless Access Points
   d. Routers
   e. Network Cards
   f. Hubs
   g. Switches
3. Discuss how these devices work together to establish and maintain a network connection. Example:
   a. What role does each device play in ensuring all-in-one connectivity and communication in a network?
   b. How do modems and routers differ in their roles in connecting to the internet?
   c. What is the significance of network cards in connecting devices to a network?
4. Identify and list the advantages and disadvantages of each device, focusing on their applications in different network setups in the table below.

S/N	Device	Advantages	Disadvantages
1	Broadband		
2	Hub		
3	Switch		
4	Modem		
5	WAP		
6	Network Card		
7	Router		

5. Present your findings in point 3 above to the class.
6. Reflect on what you learned from the other groups focusing on

a. The clarity of their explanation.

b. The accuracy of the information shared.

c. How well they differentiated between the devices and applied them to real-life situations.

EXTENDED READING

- https://broadbandusa.ntia.gov/sites/default/files/2022-12/Introduction_to_Broadband_and_High_Speed_Internet_FINAL_0.pdf



- https://www.cisco.com/c/en/us/solutions/small-business/resource-center/networking/types-of-routers.html



- https://www.cisco.com/site/us/en/learn/topics/small-business/what-is-an-access-point.html



- https://computronixusa.com/mesh-network-vs-access-point-what-are-they/



- Hub vs. Switch: What's the Difference? | Coursera



REVIEW QUESTIONS

1. Compare a switch and a hub. How do they handle data differently in a network?
2. Explain the function of a modem in a home or school network.
3. Design a simple network for a small school ICT lab using at least four network devices. Explain the role of each device
4. Evaluate the importance of a router in a wireless network and explain what would happen if it fails.

ANSWERS TO REVIEW QUESTIONS

SECTION ONE

1. To apply an animation effect to text in PowerPoint that makes it appear when you click on the slide, follow these steps:

a. Select the text or object you want to animate.

b. Go to the Animations tab in the PowerPoint ribbon.

c. In the Animation section, choose an animation effect (e.g., Fade In, Fly In or Appear).

d. Once you select an animation, click on the Animation Pane (in the same tab) to open the list of animations for the slide.

e. Right-click on the animation in the Animation Pane and select Timing.

f. In the Timing options, under Start, select On Click. This means the animation will start when you click the slide during the presentation.

2.

a. Fade Transition:

i. The fade transition gradually fades out the current slide and fades in the next slide. It provides a smooth and subtle effect, often used to make a gentle shift between slides.

ii. When to use it: Use a fade transition when you want a soft, smooth change from one slide to another, especially for presentations where you want to maintain a calm or professional feel, like in business presentations or formal meetings.

b. Push Transition:

i. The push transition moves the current slide off the screen and pushes the new slide in from a specific direction (left, right, up or down). This transition adds a bit more energy and visual interest than the fade transition.

ii. When to use it: Use a push transition when you want to create a more dynamic, visually interesting effect. This is great for creative presentations or when you want to emphasise a change in topic or flow of content. For example, use a push transition when moving from one section of the presentation to the next.

3. Animations and transitions work together in a presentation to create a smooth and engaging experience for the audience.

a. Transitions control how one slide moves out, and the next one comes in, making the shift from one idea to another more seamless and visually appealing. For example, a push transition can move a slide off the screen, while the next slide slides in from the side.

b. Animations are used to bring in or highlight elements within the slide (like text or images). For example, you can have text appear with a fade-in effect or have an image fly in from the side, adding a level of interactivity to your presentation.

4. When choosing a transition or animation effect for data, it's important to consider the following:

a. Purpose of the Data:

i. If the data is complex (e.g., a chart with multiple points or a large amount of information), use animations to highlight specific data points as they come into view. This prevents the audience from being overwhelmed by the information all at once.

ii. Use a simple transition (e.g., fade) when moving between slides, to keep the focus on the content rather than the effect.

b. Type of Data:

i. For numerical data, such as in a bar or line graph, use an animation effect like wipe or motion path to make the graph appear progressively, giving emphasis to each data point or change over time.

ii. For comparison data (e.g., comparing values across different categories), use a fly-in animation to bring the text or numbers in from different directions, so the audience can easily track each category.

c. Engagement and Audience Focus:

i. If you want to keep the audience's attention on key points, use entrance animations (e.g., zoom or fade-in) for individual pieces of data, rather than having everything appear at once.

ii. Use transitions like push or cube for a more dynamic feel when moving between sections or data types, adding interest without distracting the audience.

5. To add a table in Google Slides,

a. first click on the "Insert" menu at the top,

b. then select "Table" and choose the number of rows and columns you need.

c. After adding the table,

i. You can format it by adjusting the cell size,

ii. Adding colours to the cells for better readability and aligning text inside the cells.

iii. You can also merge cells for headings or important information and

iv. Use the Table Properties To Change The Border Styles Or Background Colour.

6. To collaborate with a team on Google Slides,
   a. You would first share the presentation by clicking the “share” button and entering the email addresses of your teammates.
   b. Ensure that everyone has appropriate access (e.G., “Can edit” for collaboration).
   c. To ensure the presentation is organised, you should agree on a consistent theme and layout at the beginning, such as colour scheme, font styles and slide transitions.
   d. Regularly communicate through comments and real-time edits to keep everyone aligned.
   e. Make sure each slide follows a logical flow and the content is easy to read with sufficient contrast, simple text and relevant visuals.
7. To present data from a spreadsheet in Google Slides,
   a. First copy the data from the spreadsheet and paste it into google slides.
   b. Then, use the “insert” menu to add a chart or graph.
   c. If the data represents categories or comparisons, a bar chart or column chart would work best to show differences clearly.
   d. If showing trends over time, a line graph would be most effective.
   e. To make the presentation more engaging, you can format the chart with colours, labels and a title.
8.
   i. Editing Views: Normal View, Slide Sorter View
   ii. Presenting View: Slide Show View
9. Arial is better because it is simple and easy to read. Decorative fonts like Curlz MT can be difficult to understand, especially for people with visual challenges.
10. Steps:
    a. Use readable fonts like Arial or Calibri.
    b. Add alt text to all images.
    c. Use high contrast colours (e.g., black text on white background).
    d. Avoid red and green together.
    e. Add captions or subtitles to any videos.
11. Checklist

a. Fonts are easy to read

b. Text is big enough

c. Colours have good contrast

d. Alt text is used for pictures

e. Videos have captions

f. Content is arranged neatly

12. To format a table in PowerPoint and make it visually appealing and easy to read:

- Use consistent font sizes and styles to make the text legible (e.g., use larger text for headings).
- Apply shading to alternating rows (zebra striping) to make it easier for the audience to follow across the rows.
- Adjust column width to ensure all data fits neatly in each cell, avoiding text overflow.
- Use bold or different colour for the header row to make it stand out and indicate that it's for titles.
- Apply borders to define each cell, ensuring the data is clearly separated.
- Use proper alignment (left-align text, center-align numbers) to keep the table neat and readable.

13. To create a line graph in PowerPoint:

- Select the dataset that includes the sales data for the months.
- Click on Insert in the PowerPoint ribbon, then choose Chart and select Line Graph from the available options.
- The X-axis will represent the months and the Y-axis will represent sales values.
- Customise the chart by adding a title, axis labels and legend if needed.
- Choose a line graph because it is the best chart type for showing trends over time. The line graph will help highlight patterns in the sales data, allowing you to clearly see whether sales are increasing or decreasing from one month to the next.

14. To choose the best table format for displaying a schedule:

a. Use clear headers for the days of the week or time slots (e.g., Monday, Tuesday, Wednesday or 9AM, 10 AM etc.) This makes it easy for the reader to identify the schedule categories.

b. Use alternating row colours or shading to differentiate between different periods or activities. This makes it easier to follow the information.

c. Adjust column width to ensure that the text is not cramped and is readable.

d. Align text properly (e.g., left-align for descriptions and centre-align for times) to maintain neatness and consistency.

e. Apply borders to keep the content organised and visually distinct. This helps avoid confusion when looking at various rows and columns.

f. Why these choices are effective: Proper headers provide clarity on what each row/column represents. Shading and alternating row colours improve readability and help the user easily track across rows. Proper alignment ensures that the information is neatly presented, reducing visual clutter and making it easier for users to quickly find the information they need.

15. Interactivity in a website makes it more engaging by allowing users to actively participate in the experience, rather than just passively consuming information. This leads to a more personalized and dynamic experience for users. For example, when a user clicks on a button, submits a form or takes part in a quiz, the website responds, giving them immediate feedback or results. Some common interactive elements found on websites include:

a. Buttons: Users can click buttons to perform actions like submitting forms or navigating between pages.

b. Forms: Forms allow users to input information, such as signing up for newsletters or providing feedback.

c. Navigation Menus: Drop-down or sliding menus let users easily navigate between different sections of a website.

d. Quizzes or Surveys: These interactive features help engage users by allowing them to test their knowledge or provide input.

e. Videos and Animations: Interactive videos and animations that respond to user clicks or actions.

f. Chatbots: Real-time assistance through automated or live chat.

16. Hyperlinks are crucial in educational apps and websites because they provide quick and easy access to additional resources, related content and different sections within the app or website. Hyperlinks allow learners to navigate seamlessly from one topic to another without needing to search manually for information.

Using hyperlinks improves the learning experience in several ways:

a. Quick Access to Information: Hyperlinks enable learners to access additional resources, such as explanations, videos or examples, that help clarify complex concepts.

b. Organisation and Structure: Hyperlinks allow content to be organized in a structured manner, making it easy for learners to jump to relevant sections without getting lost.

c. Interactive Learning: Hyperlinks encourage active learning by allowing learners to explore related content. For instance, they can click on a term to view a definition or access a detailed explanation.

d. Enhanced Engagement: Hyperlinks, especially in interactive elements like quizzes, videos and activities, keep learners engaged by encouraging them to participate and explore more about the topic.

17. To format a bar chart and make it clearer and more visually appealing, focus on the following key elements:

Labelling the Axes: Ensure that both the X-axis (horizontal) and Y-axis (vertical) are clearly labelled with the appropriate categories and values. For example, label the X-axis with the subjects (if showing student performance) and the Y-axis with the score range or percentage.

Colour Contrast: Use distinct, contrasting colours for each bar so that the differences between categories are easy to spot. Avoid using too many colours that could make the chart look cluttered or difficult to read.

Title and Legend: Add a clear, descriptive title to the chart to explain what the data is showing (e.g., “Learners’ Performance in Different Subjects”).

Bar Width and Spacing: Adjust the width of the bars so that they are proportionate to the data and not too wide or narrow. The spacing between the bars should be even, making the chart easier to interpret.

Gridlines: Subtle gridlines on the background can help the audience follow the values represented by the bars, but avoid making them too bold or distracting.

Font Size and Style: Ensure that the text in the chart, such as labels and values, is large enough to read and is clearly visible. Use simple fonts that are easy to read.

18. The choice of chart type depends on the type of data being presented and what you want to convey:

Bar Chart: Best for comparing different categories (e.g., student performance across different subjects).

Bar charts are great when you want to show differences between groups clearly and easily compare values. For example, if you are comparing student

performance in Math, English, Science, etc., a bar chart would allow you to clearly see which subject has the highest or lowest performance.

Why Choose It: Bar charts provide a clear visual comparison of categories, making it easy for the audience to quickly grasp the differences in data.

Pie Chart: Best for showing parts of a whole. For example, if you are showing the percentage of total performance across different subjects, a pie chart would show how much each subject contributes to the total performance.

Why Choose It: Use a pie chart if you want to represent proportions or percentages of a total. It is most useful when you have fewer categories (ideally 3-5) and want to emphasise the percentage distribution.

Line Graph: Best for showing trends over time. If you are tracking learners' performance over several months or years, a line graph is the best choice.

Why Choose It: Line graphs are ideal for showing changes over time, helping the audience see patterns or trends. For example, you could use a line graph to show how student performance in different subjects has improved or declined over time.

SECTION TWO

1.

a. WhatsApp: This is widely used for instant messaging and group chats, allowing teachers to share learning materials, assignments and reminders quickly. learners can ask questions, discuss homework and collaborate on projects in real-time.

b. Zoom: Zoom is popular for virtual lessons and video conferences, especially for schools that may not be able to conduct in-person classes. Teachers can conduct live lessons, demonstrations and Q&A sessions, while learners can interact, ask questions and participate in group activities.

c. Google Meet: Like Zoom, Google Meet is used for live, synchronous classes where teachers and learners can meet virtually for real-time discussions. It also allows for screen sharing, which helps in presenting teaching materials directly to learners.

2.

a. YouTube: Students in Ghana can access educational videos, tutorials, and entertainment content whenever they want. It has become a popular platform for learning, with students watching educational channels for subjects like mathematics, science, and language. However, distractions from entertainment content (like music videos, gaming, etc.) can sometimes hinder focus on educational content.

b. Spotify: Spotify has changed how students in Ghana listen to music. Students no longer need physical CDs or radio broadcasts; they can stream their favourite songs, playlists, and podcasts anytime. This makes entertainment more accessible and personalised, allowing for easier exploration of new music and learning resources through podcasts. The challenge is that Spotify requires a stable internet connection and may involve subscription fees for premium services.

c. TikTok: TikTok has become a major source of entertainment, allowing users to create and share short, creative videos. For students, it serves as both entertainment and a platform for creativity, where they can showcase talents and engage in viral challenges. The main challenge with TikTok is that students can easily get distracted by short videos, which may reduce their academic productivity.

3.

a. Facebook: Facebook is mainly used for social networking with family and friends. It allows you to share updates, create events and join groups to discuss specific topics. For example, you might join a study group on Facebook to collaborate on assignments.

b. Instagram: Instagram is focused on visual content like photos and videos. It's mainly used for sharing lifestyle updates, brand promotion and visual storytelling. For example, a fashion influencer might use Instagram to promote products through stories and posts.

c. Twitter: Twitter is used for sharing short messages called tweets. It's best for news updates, discussions and public debates. For example, politicians and celebrities use Twitter to share quick thoughts and engage in real-time conversations.

4.

a. Synchronous tools like Google Meet or Zoom are useful for real-time meetings where the team can discuss tasks, ask questions and make decisions together. You can plan meetings at times that work for everyone, even if it's at different hours.

b. Asynchronous tools like email, Google Docs or Slack are useful for sharing updates, documents and feedback without needing everyone to be online at the same time. These tools ensure that team members can work at their own pace and stay updated on progress.

5. Social media platforms like Facebook and Instagram have had a significant impact on communication among teenagers. Here are both positive and negative effects

Positive Effects

a. Enhanced Connectivity: Teenagers can easily stay connected with friends and family, regardless of geographical distance. Social media allows for instant messaging, voice calls and video calls, making it easy to communicate anytime.

b. Broader Network: These platforms allow teenagers to connect with a wider network of people beyond their local community, enabling them to learn about different cultures, ideas and experiences.

Negative Effects

a. Cyberbullying and Peer Pressure: Teenagers may experience cyberbullying or negative comparisons when they see idealised versions of others' lives, which can affect their self-esteem and mental well-being.

b. Superficial Communication: While social media allows quick communication, it can sometimes lead to less meaningful and deeper conversations. Teenagers may rely on short texts, emojis or pictures rather than engaging in face-to-face discussions.

6.

- For social causes

  Platforms like Twitter (X) and Instagram are great for spreading awareness about social causes. Twitter (X) allows for quick updates, trending hashtags, and real-time engagement with current events. Instagram is ideal for sharing visual content like infographics or short videos that engage people emotionally. For example, a campaign like #EndPlasticPollution could use Instagram to post impactful photos of pollution and Twitter to share real-time updates or news related to the cause.

- For professional networking

  LinkedIn is the best platform for career-related activities. It focuses on professional connections, job listings, and showcasing skills or achievements. For example, a student looking for internship opportunities would use LinkedIn to connect with potential employers, join industry groups, and create a professional profile.

7.

a. Set Time Limits on Social Media Use

i. Why: Excessive use of social media can lead to feelings of isolation and anxiety, especially when teenagers compare themselves to others or feel left out.

ii. How: Teenagers can set daily or weekly limits on their screen time to prevent social media from taking over their daily activities. Apps like Digital Wellbeing on Android devices allow users to set limits for individual apps.

b. Practice Positive Online Behaviour

i. Why: Social media can be a space for negative comparison or bullying, which negatively affects mental health.

ii. How: Teenagers can engage in positive behaviours like spreading kindness, avoiding trolling or harsh comments, and creating a supportive online environment for themselves and others. They should also avoid comparing themselves to idealised versions of others online and focus on their personal growth.

8.

a. Email: You can attach the class materials and assignments to an email and send them to the entire class. In the body of the email, include clear instructions and deadlines. This way, everyone receives the information, and they can open it whenever they are available to work on it.

b. Google Drive: Upload the materials to Google Drive in a shared folder. Ensure that the folder is accessible to all classmates by adjusting the sharing settings (e.g., set it to "Anyone with the link can view" or share with specific email addresses). This allows classmates to access, edit, or comment on documents and assignments at their convenience. Google Docs is especially useful because it enables real-time collaboration and feedback, allowing multiple people to work on the same document at the same time.

9. To design a successful hashtag campaign for raising awareness about mental health, you should focus on a clear message, engagement and choosing the right platform(s).

a. Designing the Hashtag Campaign:

i. First, come up with a memorable and meaningful hashtag like #MentalHealthMatters or #BreakTheStigma. The hashtag should be simple, easy to remember, and directly related to the topic.

ii. Include visuals, such as infographics, videos, or personal stories that help explain the importance of mental health and encourage participation in the campaign.

iii. Encourage people to share their own experiences or thoughts about mental health using the hashtag, creating a community around it.

b. Choosing the Right Platform(s):

i. Instagram: It is perfect for visually engaging content, such as videos, photos, and stories, which could include infographics or people sharing their personal mental health journeys. It is widely used by young people, making it an ideal platform to reach your target audience.

ii. Twitter (X): This platform is great for real-time updates, using trending hashtags and connecting with a broad audience. Twitter also enables you to interact with mental health organisations or experts.

iii. Facebook: Facebook's Groups and Events features are effective for building a community, hosting live events, or discussing mental health awareness.

iv. TikTok: If you're targeting teens or young adults, TikTok is ideal for creating short, impactful videos and challenges that encourage widespread participation in the campaign.

SECTION THREE

1. Two-factor authentication (2FA) adds an extra layer of security by requiring two forms of identification before you can access your account. First, you enter your password and then a second verification, like a code sent to your phone or email, is required. This makes it much harder for someone to hack your account, even if they know your password. For example, when you log into Gmail, after entering your password, you will be asked to enter a code sent to your phone. This way, even if someone steals your password, they cannot access your account without the second form of verification.

2. Adjusting privacy settings is crucial to protect your personal information on social media and communication platforms. It ensures that only trusted people can see your posts, personal details and activities. For platforms like Facebook or WhatsApp, adjusting your privacy settings can prevent strangers from accessing your data and can stop unwanted people from contacting you. I would advise a friend in Ghana to:

a. Set their Facebook profile to private so only friends can see their posts.

b. Review Who Can See My Information and restrict it to friends only.

c. Use WhatsApp's privacy settings to control who can see your profile photo, status updates and last seen.

d. Be cautious about the permissions apps ask for and avoid granting access to unnecessary data (e.g., microphone, location).

This helps limit exposure to potential online threats while keeping their personal information safe.

3. You can combine Zoom and Google Classroom to create a well-rounded learning experience. Zoom can be used for live, interactive lessons where teachers can

explain topics, answer questions, and engage learners in real time. After the lesson, Google Classroom can be used to assign homework, share resources (e.g., notes and videos), and track progress. Learners can complete assignments in Google Classroom and submit them directly, making it easier for teachers to provide feedback. This combination helps to keep learners engaged and organised in their learning.

4. For learners with limited internet access, you can use a blended learning approach. Zoom can still be used for short live lessons that do not require a continuous internet connection. For learners with poor internet, you can record the Zoom session and upload it to Google Classroom so they can watch it later. Use Google Classroom to post assignments, notes and pre-recorded lessons that learners can access offline. Once they complete assignments, they can submit them on Google Classroom when they have internet access. This ensures learners with limited access still benefit from learning materials while allowing for flexibility in completing tasks.

5. To integrate Google Meet and Google Classroom effectively, you would;

   a. Link Google Meet with Google Classroom: Teachers can schedule live sessions directly in Google Classroom using Google Meet. This integration ensures that learners receive a seamless experience where they can access their class materials and join live sessions without switching between platforms.

   b. Assign and Share Materials via Google Classroom: Teachers can share assignments, lecture notes and study resources in Google Classroom and during the Google Meet sessions, they can refer to these materials in real-time.

   Benefits of Integration

   a. Streamlined Workflow: Teachers can manage everything in one place—assignments, grading, communication and virtual meetings. This reduces the need for learners to navigate multiple platforms.

   b. Real-Time Interaction: Google Meet allows for live interaction, which can be recorded and uploaded to Google Classroom for learners to review later.

   Challenges

   a. Technical Issues: Internet connectivity or device limitations can disrupt live video sessions on Google Meet.

   b. Learning Curve: Both teachers and learners may need time to become familiar with integrating both tools effectively.

6. Improved Learning Experience

   a. Google Classroom can serve as the central hub for assignments, feedback and communication.

   b. iCampusGH, a platform used by Ghana's education system, could be integrated with Google Classroom to provide access to national resources and curricula.

   Challenges

   a. Internet Access: Limited or unstable internet connections in rural areas of Ghana could disrupt access to digital tools. This could be addressed by integrating offline tools (such as CENDLOS's iBox) to ensure learners in low-connectivity areas still have access to course materials. When internet access is available, learners can sync their progress.

   b. Device Availability: Many learners might not have access to smartphones or computers. To address this, schools and the government could distribute affordable devices or set up local digital learning centres where learners can access tools.

   Strategies to Overcome Challenges

   a. Blended Learning Models: Incorporating offline resources into the curriculum, such as printed learning materials and enabling learners to sync with digital platforms when internet access is available.

   b. Government Support for Digital Inclusion: The Ghanaian government could work with educational tech companies to provide affordable internet packages or devices to learners in underserved areas.

SECTION FOUR

1. Plug-ins are small software components that add specific functionality to a website, enabling features that may not be built in by default. They are typically used to extend or enhance the features of a website without modifying the core code.

   How they enhance functionality

   a. Plug-ins allow websites to integrate additional capabilities like audio players, video streaming, interactive maps and more.

   b. They improve user engagement by adding dynamic elements that would otherwise require custom coding.

   c. They can improve security and performance by offering functionalities such as spam protection, SEO optimisation or form validation.

   An example of a plug-in is Google Maps

ANSWERS TO REVIEW QUESTIONS

2. HTML (Hypertext Markup Language), CSS (Cascading Style Sheets) and JavaScript are the core technologies used to create websites. Each plays a distinct role in the overall structure and functionality

   a. HTML: Provides the structure of a website by using tags to define elements like headings, paragraphs, links and images. It forms the skeleton of the webpage.

   b. CSS: Defines the visual style and layout of a webpage. CSS controls aspects like font styles, colours, margins and spacing, ensuring that the page looks appealing and is well-organised.

   c. JavaScript: Adds interactivity to the website. JavaScript enables features like form validation, interactive maps and dynamic content updates (e.g., changing content without refreshing the page).

   How they work together

   a. HTML gives structure, CSS enhances the look and feel, and JavaScript adds interactive functionality.

   b. These three technologies work in harmony to create a seamless user experience by ensuring that the webpage is well-structured, visually attractive and interactive.

   For example, HTML provides the content, CSS makes it visually appealing, and JavaScript allows users to interact with the page (e.g., clicking buttons or submitting forms without reloading the page). This combination improves the usability, navigation and engagement of the website.

3. Digital media like images and videos enhance both the design and functionality of a website in several ways.

   - Visual Appeal: Images and videos make a website more attractive, helping to grab visitors' attention and improve engagement. A visually appealing site encourages users to stay longer and explore more content.
   - Content Clarification: Videos and images can simplify complex information, making it easier for users to understand. For example, product images or video tutorials help users make informed decisions.
   - Brand Identity: Digital media allows websites to showcase their brand by using consistent visuals, logos and themes that reflect the company's identity and values.
   - User Interaction: Interactive media, such as image galleries or videos, can enhance user interaction, leading to a more engaging experience.

4. When designing a website or digital content with accessibility in mind, key principles to consider include;

- Text Contrast: Ensure sufficient contrast between text and background for easy readability, especially for users with visual impairments.
- Keyboard Navigation: Design the website so that all interactive elements (e.g., buttons, forms) can be navigated using a keyboard for users who cannot use a mouse.
- Screen Reader Compatibility: Use proper HTML markup and alt text for images, so screen readers can describe visual content to users with blindness or low vision.
- Responsive Design: Ensure the website adjusts appropriately on various screen sizes, making it accessible on mobile devices, desktops and assistive technology devices.
- Clear Navigation: Organise content with easy-to-find menus, headings and links, ensuring users with cognitive impairments can navigate smoothly.
- Audio and Video Accessibility: Provide transcripts or captions for audio and video content to make them accessible to users who are deaf or hard of hearing.

5. Copyright and licensing dictate how multimedia content (like images, videos and music) can be used, shared and redistributed. Understanding these legal constraints is important for ensuring the ethical and legal use of content.

- Copyright: The creator of the content (author, artist, photographer) holds the rights to that work, meaning they control how it is used. Unauthorised use of copyrighted content without proper permission can result in legal consequences.
- Licensing: Licensing grants specific permission for how content can be used. For example, Creative Commons licenses allow for free use of content under certain conditions, such as attribution or non-commercial use.

To follow proper licensing procedures

- Check License Terms: Always review the terms of use or licensing associated with content before using it. For example, some content may require attribution or may be restricted to personal use only.
- Use Public Domain or Licensed Content: When possible, use public domain or Creative Commons-licensed content, which is freely available for use.
- Obtain Permission: For content that is copyrighted and not freely available, you must seek explicit permission from the copyright holder to use or share it.
- Provide Attribution: If required by the license (like Creative Commons), always credit the original creator of the content appropriately.

ANSWERS TO REVIEW QUESTIONS

SECTION FIVE

1. A switch sends data directly to the intended device using MAC addresses, while a hub sends data to all connected devices regardless of the destination.
2. A modem converts digital signals from a computer into signals suitable for transmission over phone or cable lines and vice versa, enabling internet access.
3.
   - Modem (connects to the internet)
   - Router (directs internet traffic to devices)
   - Switch (connects multiple computers)
   - Access Point (provides Wi-Fi to wireless devices)

   NB: Use a diagram for your illustration
4. A router directs data to the right devices and connects the network to the internet. If it fails, internet access and internal communication would stop.

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GLOSSARY

- **Access Control:** The practice of managing who has permission to view, edit or interact with certain data or systems.
- **Accessibility:** The practice of designing websites, apps and digital content in a way that makes them usable for people with various disabilities, ensuring equal access for all users.
- **Access Point (AP):** A device that allows wireless devices to connect to a wired network using Wi-Fi.
- **Affordances:** The functions or capabilities of a tool that allow users to achieve specific goals.
- **Alt Text:** A short description added to images so screen readers can explain them to people with low vision.
- **Animation Effect:** A visual effect applied to text, images or objects within a slide to make them appear, disappear or move in a specific way. It helps make a presentation more engaging by adding movement to the content.
- **Asynchronous Communication:** Communication that does not require participants to be available at the same time. Responses can be delayed
- **Axis Labels:** The labels placed along the X-axis (horizontal) and Y-axis (vertical) of a graph or chart to describe the data being represented, such as "time," "sales," or "categories." These labels help the audience understand what the axes represent.
- **Background:** The colour, image or design behind the content on each slide.
- **Bandwidth:** The amount of data that can be transmitted over a network connection in a given time.
- **Bridge:** A device that connects two or more network segments and helps control data traffic between them.
- **Broadband Device:** A device used to provide high-speed internet access, such as a modem or broadband router.
- **Chart Type:** The different formats used to display data visually, such as bar charts, line graphs, pie charts, etc. Each chart type is suitable for different kinds of data and helps to communicate information effectively.
- **Cloud Storage:** A service that allows users to store data online rather than on their physical devices, making it accessible from any device with an internet connection. Examples include Google Drive, OneDrive and Dropbox.
- **Collaboration Tools:** Digital platforms that enable individuals to work together on projects, share information and communicate effectively, often in real time.
- **Colour Scheme:** A set of colours used in the presentation that match well and help with readability.
- **Copyright:** The legal right granted to the creator of original content (such as books, music and websites) to control how their work is used, distributed and reproduced.
- **CSS (Cascading Style Sheets):** CSS is a style sheet language used for describing the presentation (layout, design and formatting) of a document written in HTML. It controls the appearance of elements on a webpage.
- **Cyberbullying:** The use of digital platforms to harass, threaten, or intimidate others. It typically involves repeated harmful behaviour, such as sending mean messages, spreading rumours, or posting embarrassing photos.

- **Data Transmission:** The process of sending digital data from one device to another across a network.
- **Digital Literacy:** The ability to effectively use digital tools and platforms for communication, learning and problem-solving.
- **Digital Media:** Content that is created, shared or accessed using digital devices. It includes text, images, audio, video and interactive elements.
- **E-commerce Website:** A type of website that allows businesses or individuals to buy and sell goods and services online.
- **Educational Website:** A site designed to teach or support learning, often including lessons, tutorials or quizzes (e.g., Ghana Learning Passport).
- **Encryption:** The process of converting information or data into a code to prevent unauthorised access.
- **Entertainment Website:** A site that offers music, videos, games or other forms of entertainment (e.g., YouTube).
- **Firewall:** A network security system that monitors and controls incoming and outgoing traffic based on security rules.
- **Follower:** A person who subscribes to receive updates or posts from a particular user or page on social media.
- **Graphics:** Visual elements like icons, logos, banners and illustrations used to support or decorate web content.
- **Hashtag:** A word or phrase preceded by the "#" symbol used on social media to categorize or find posts related to a specific topic.
- **HTML (Hypertext Markup Language):** HTML is the standard markup language used to create and design web pages. It defines the structure of web pages by using a system of tags and attributes.
- **Hub:** A basic network device that connects computers in a network and broadcasts data to all connected devices.
- **Hyperlink:** A clickable text, image or icon that takes the user to another page, document or section within the same webpage. It allows users to navigate quickly between different pieces of content on the web.
- **Interactive Media:** Web content that allows users to interact with it, such as forms, quizzes, games and clickable maps.
- **Interactivity:** The ability of a system (website, app or software) to respond to a user's input or actions, such as clicks, typing or tapping. It allows users to engage with the content actively.
- **Interoperability:** The ability of different digital tools or systems to work together and exchange data seamlessly.
- **Legend:** A key that explains what the colour, shapes or patterns in a chart or graph represent. For example, in a pie chart, a legend might explain which colour corresponds to each category, such as 'Math' = blue, 'English' = red, etc.
- **Local Area Network (LAN):** A network that connects devices within a limited area like a school, home or office.
- **Modem:** A device that converts digital signals into analogue signals (and vice versa) to enable internet access over phone or cable lines.

- **Multimedia:** The use of multiple forms of content, including text, audio, images, video, and animations, to convey information.
- **Network Device:** A piece of hardware or software that enables devices to connect and communicate within a network.
- **Network Interface Card (NIC):** A hardware component that allows a computer or device to connect to a network.
- **News Website:** A platform that provides current news, articles and updates (e.g., MyJoyOnline).
- **Packet:** A formatted unit of data transmitted over a network
- **Placeholder:** Boxes on slides where you can add text, pictures, videos or charts.
- **Platform:** A digital service or application used for communication, content sharing or collaboration.
- **Privacy Settings:** Options on a platform or application that allow users to control who can see their personal information, posts or activity.
- **Remote Work:** A working arrangement that allows employees or students to perform their tasks from any location outside the traditional office or classroom, typically using digital tools and internet access.
- **Repeater:** A device that boosts and extends the signal in a network to cover longer distances.
- **Router:** A device that directs data between different networks, such as between a home network and the internet.
- **Slide master:** A special tool that controls the design of all slides at once. Saves time and keeps slides looking the same.
- **Slide Show View:** Shows your slides full-screen, like when presenting to a class.
- **Switch:** A device that connects multiple devices within a local network and sends data only to the device it is intended for.
- **Synchronous Communication:** Communication that happens in real-time, where participants exchange messages instantly.
- **Tag:** To mention or identify someone in a post or image, usually by using the "@" symbol or a direct link to their profile.
- **Template:** A pre-designed layout or structure for creating presentations, which includes specific styles, fonts, colours and designs that can be customised with your content. Templates help save time and ensure consistency in design.
- **Theme:** A ready-made design for slides, with matching colours, fonts and background.
- **URL (Uniform Resource Locator):** The address used to access a specific website or web page (e.g., www.example.com).
- **Virtual Collaboration:** The process of working together with others using digital tools, regardless of physical location, to complete tasks, share information and collaborate on projects.
- **Web Page:** A single document or screen on a website that can display text, images, videos and other content.
- **Wireless Network:** A network where devices connect and communicate without physical cables

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List of Contributors

Name	Institution
Osei Amankwa Gyampo	Kumasi Wesley Girls High School
Kipo Fuseini	Sawla SHS