FOURTH EDITION

FOR GRADE 4

KEYBOARD

Computer Science with Application Software

TEACHING GUIDE

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Introduction

Keyboard: Computer Science with Application Software teaching guide is designed to empower educators and engage young learners, providing a valuable tool for teaching computer concepts to students in grades 1-5.

Features

Scheme of Work

This is a comprehensive curriculum outline for the grade that ensures a structured and coherent learning journey. It provides a detailed breakdown of the number of lessons for each chapter and topic and the core competencies and digital content mapped for teachers' convenience.

Lesson Plan

This instructional sequence outlines teaching strategies for one topic from the chapter learning objectives for students and teachers. It highlights core competencies and includes measures of success, like formative assessments and performance indicators, to help teachers track student progress effectively and design their own lesson plans accordingly.

Engagement Activities

Additional exercises to reinforce core lessons are designed to be engaging and interactive. These activities may include hands-on projects, problem-solving tasks, research assignments, and group work. It offers alternative explanations and additional practice opportunities that allows students to succeed, regardless of their current performance level.

This collaborative guide has compiled insights from educational experts and the latest teaching methods to offer a comprehensive resource for computer education in the primary grades. It serves to create an engaging and effective learning environment that promotes the curiosity of students.

CONTENTS

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Scheme of Work

Chapter	No. of Periods	Core Competencies	Learning Objectives	Teaching Objectives	Additional Resources	
1. Exploring Windows	6	Critical Thinking, Problem Solving	Understand the basic functions and uses of the Windows Operating System.	To explain the purpose of an operating system and specifically Windows.	• Pictures of different OS versions (Windows 7, 8, 10, 11). • Short videos explaining OS functionality. • Handout comparing different OS versions (simplified).	
		Observation, Attention to Detail	Identify and label the main components of the Windows 10 desktop interface.	To teach the vocabulary and layout of the Windows 10 desktop.	• Critical Thinking, Problem Solving	
		Information Literacy, Practical Application	Understand and use basic Windows 10 features like search and shortcuts.	To demonstrate and provide practice with essential Windows 10 tools.	• Step-by-step guides for using search and creating shortcuts. • Practice exercises for creating and using shortcuts. • 'Search Challenge' to find specific files or programs.	
		Analytical Thinking, Problem Solving	Explore the Task Manager to understand basic system monitoring.	To introduce the Task Manager as a tool for understanding computer performance.	• Simplified explanations of processes and performance metrics. • Screenshots of the Task Manager with labeled sections. • Demonstration of closing a non-responsive application.	
		Adaptability, Flexibility	Understand and utilize Task View and Tablet Mode for flexible working.	To demonstrate and provide practice with features that enhance flexibility.	• Demonstrations of Task View and Tablet Mode. • Step-by-step guides for accessing and using these features. • Practice exercises for switching between modes.	
		Problem Solving, Logical Reasoning	Learn basic troubleshooting steps for Windows 10.	To teach basic problem-solving skills related to common computer issues.	• Simple troubleshooting flowcharts. • Step-by-step guides for basic troubleshooting. • Practice scenarios for troubleshooting common problems.	
2. Email Communication	6	Communication, Information Literacy	Understand the concept and importance of email.	To introduce email as a communication tool and its advantages.	• Visual aids showing email flow. • Real-world examples of email use (e.g., sending invitations). • Discussion about the importance of global communication.	
		Navigation, Observation	Explore the Gmail interface and basic features.	To familiarise students with the Gmail platform and its functions.	• Screenshots of the Gmail interface with labeled elements. • Guided exploration of the Gmail website. • 'Gmail Scavenger Hunt' to find specific features.	

	Reasoning	Communication	Connection	ICT Activities	Additional Strategies
	To build foundational understanding of the role of an OS in a computer.	Students will be able to explain the general purpose of windows operating system.	Connect the operating system to real world examples like a manager, or a traffic controller.	• Interactive quizzes on OS functions. • Visual presentations of different Windows versions.	• Use of interactive whiteboards to demonstrate OS functionalities. • Gamification of OS features (e.g., matching games).
	To familiarise students with the visual components of the user interface.	Students will be able to clearly identify and name the basic components of the desktop.	Relate desktop elements to physical world equivalents (e.g., taskbar as a to-do list).	• Online desktop interface labeling games. • Use of screen capture tools to annotate desktop elements.	• Virtual desktop tours with interactive elements. • Augmented reality (AR) overlays for desktop exploration (if feasible).
	To empower students to efficiently navigate and access resources.	Students will be able to effectively search for files and create shortcuts.	Connect search function to finding books in a library, shortcuts to quick access to needed items.	• Hands-on practice using the Windows search bar. • Creating shortcuts to commonly used programs.	• Collaborative online document creation with shared shortcuts. • Use of voice commands (if applicable) for search.
	To provide a basic understanding of how the computer manages tasks.	Students will be able to identify basic functions within the task manager.	Relate processes to tasks being done by a person, performance to how fast or efficient those tasks are done.	• Guided exploration of the Task Manager interface. • Simple demonstrations of ending processes (with caution). • Viewing CPU usage.	• Using simulated task manager applications. • Visual representations of CPU and memory usage (e.g., graphs).
	To encourage students to adapt their working environment to their needs.	Students will be able to describe and use task view and tablet mode.	Relate task view to having multiple desktops, tablet mode to using a digital notebook.	• Hands-on practice with Task View and Tablet Mode on available devices. • Creating multiple virtual desktops in Task View.	• Using touch-enabled devices for Tablet Mode demonstrations. • Collaborative brainstorming sessions using Task View.
	To equip students with basic troubleshooting skills for common issues.	Students will be able to describe and perform basic troubleshooting steps.	Relate troubleshooting to fixing a toy or solving a puzzle.	• Guided practice with simulated troubleshooting scenarios. • Demonstrations of restarting, checking for updates, and freeing disk space.	• Using online troubleshooting simulations. • Creating troubleshooting guides (posters or digital documents).
	To establish the foundation for understanding digital communication.	Students will be able to explain the importance of email in modern communication.	Connect email to traditional mail and explain the speed and efficiency difference.	• Interactive presentations explaining email concepts. • Short videos demonstrating email communication.	• Use of digital storyboards to illustrate email scenarios. • Collaborative online discussions about email use.
	To build familiarity with a widely used email platform.	Students will be able to navigate and use the basic features of Gmail.	Relate Gmail features to real-world equivalents (e.g., inbox as a mailbox, labels as folders).	• Hands-on practice with Gmail accounts (if school policy allows). • Interactive quizzes on Gmail features.	• Virtual Gmail tours with interactive annotations. • Gamified Gmail interface navigation exercises.

Chapter	No. of Periods	Core Competencies	Learning Objectives	Teaching Objectives	Additional Resources	
		Practical Application, Writing Skills	Learn to compose, format, and send emails.	To teach the process of composing and sending emails with proper formatting.	• Templates for composing simple emails. • Step-by-step guides for attaching files and formatting text. • Practice exercises for composing different types of emails.	
		Organisation, Information Management	Understand email organisation through labels and folders.	To teach effective email management techniques.	• Demonstrations of creating and applying labels. • Practice exercises for organising emails. • Email Sorting Challenge' to categorize emails using labels.	
		Critical Thinking, Safety Awareness	Learn about computer safety and email vigilance.	To teach basic computer safety and email security practices.	• Posters illustrating safe email practices. • Scenarios for identifying phishing emails. • Discussion about password protection and malware.	
		Practical Application, Information Sharing	Understand attachment options and forwarding of emails.	To demonstrate how to share files and forward email communication.	• Step-by-step guides for attaching files and forwarding emails. • Practice exercises for attaching different file types. • Example forwarded emails to discuss proper forwarding etiquette.	
3. Creating digital design with Canva	7	Creativity, Information Literacy	Understand the concept of digital publishing and its uses.	To introduce the concept of digital publishing and its relevance to students.	• Examples of digital publications (posters, presentations, social media graphics). • Discussion on how digital design is used in everyday life. • Brainstorming session on student uses of digital design.	
		Visual Literacy, Critical Thinking	Learn basic design fundamentals (line, form, balance, shape, texture, color, negative space).	To teach the fundamentals of design and their application.	• Visual examples of each design element. • Hands-on activities with drawing and manipulating shapes. • 'Design Element Scavenger Hunt' in everyday objects.	
		Navigation, Observation	Explore the Canva interface and its key features.	To familiarise students with the Canva platform and its tools.	• Screenshots of the Canva interface with labeled elements. • Guided exploration of the Canva website. • 'Canva Feature Scavenger Hunt' to locate specific tools.	
		Practical Application, Creativity	Create designs using Canva templates, elements, and text.	To teach the process of creating designs using Canva's tools.	• Step-by-step guides for creating different types of designs. • Templates for creating posters, cards, and presentations. • Practice exercises for adding text, images, and elements.	

	Reasoning	Communication	Connection	ICT Activities	Additional Strategies
	To develop essential digital communication skills.	Students will be able to compose, format, and send simple emails with attachments.	Connect email writing to letter writing, emphasising clarity and politeness.	• Hands-on practice composing and sending emails (if school policy allows). • Demonstrations of text formatting and attachment options.	• Collaborative email writing projects. • Use of online writing tools for grammar and spelling checks.
	To promote efficient information management in a digital environment.	Students will be able to efficiently organise emails using labels.	Relate labels to physical filing systems.	• Hands-on practice creating and applying labels in Gmail. • Visual representations of email organisation.	• Use of digital mind maps to plan email organisation. • Collaborative email organisation projects.
	To foster responsible digital citizenship and safety.	Students will be able to describe and apply basic computer safety practices.	Relate computer safety to real-world safety (e.g., looking both ways before crossing the street).	• Interactive quizzes on computer safety and email vigilance. • Demonstrations of antivirus software and password protection.	• Use of simulated phishing emails for practice. • Role-playing scenarios to demonstrate safe online behavior.
	To efficiently share information using email.	Students will be able to attach files to and forward emails.	Relate attaching files to attaching documents to a letter.	• Hands-on practice attaching and forwarding emails. • Demonstrations of different attachment types.	• Collaborative projects involving sharing files via email. • Using cloud storage integration for file sharing demonstrations.
	To establish the importance of digital design in modern communication.	Students will be able to explain the uses of digital publishing in school and daily life.	Connect digital publishing to creating posters for school events or presentations.	• Interactive presentations showcasing digital design examples. • Short videos explaining digital publishing.	• Use of online collaborative boards to brainstorm digital design ideas. • Digital portfolios showcasing student work.
	To build a foundation for understanding visual communication.	Students will be able to identify and explain basic design principles.	Relate design principles to art and visual communication in everyday life.	• Interactive design quizzes. • Creating simple designs using basic shapes and colors.	• Use of digital drawing tools to explore design elements. • Augmented reality (AR) overlays for design element identification.
	To build familiarity with a user-friendly digital design tool.	Students will be able to navigate and use the basic features of Canva.	Relate Canva features to real-world design tools (e.g., templates as stencils).	• Hands-on practice with Canva accounts. • Interactive tutorials on Canva features.	• Virtual Canva tours with interactive annotations. • Gamified Canva feature exploration exercises.
	To develop essential digital design skills.	Students will be able to create simple designs using Canva.	Connect Canva design to creating posters, cards, or invitations.	• Hands-on practice creating designs in Canva. • Demonstrations of text effects and element manipulation.	• Collaborative design projects in Canva. • Use of online design feedback tools.

Chapter	No. of Periods	Core Competencies	Learning Objectives	Teaching Objectives	Additional Resources
		Image Manipulation, Practical Application	Learn to upload and format images in Canva.	To teach the process of incorporating and manipulating images in designs.	• Step-by-step guides for uploading images. • Practice exercises for cropping, resizing, and adjusting transparency. • Demonstrations of image animation.
		Organisation, Collaboration	Understand how to save, organise, and share Canva designs.	To teach effective design management and collaboration.	• Demonstrations of saving and creating folders. • Step-by-step guides for sharing designs. • Practice exercises for collaborating on a design.
		Practical Application, Efficiency	Learn tips for using Canva effectively.	To improve student workflow within Canva.	• List of Canva tips and tricks. • Demonstrations of keyboard shortcuts and efficient tool usage. • Practice exercises implementing the tips.
4. Fundamentals of Design Thinking	7	Creativity, Information Literacy	Understand the concept of digital publishing and its uses.	To introduce the concept of digital publishing and its relevance to students.	• Examples of digital publications (posters, presentations, social media graphics). • Discussion on how digital design is used in everyday life. • Brainstorming session on student uses of digital design.
		Visual Literacy, Critical Thinking	Learn basic design fundamentals (line, form, balance, shape, texture, color, negative space).	To teach the fundamentals of design and their application.	• Visual examples of each design element. • Hands-on activities with drawing and manipulating shapes. • 'Design Element Scavenger Hunt' in everyday objects.
		Navigation, Observation	Explore the Canva interface and its key features.	To familiarise students with the Canva platform and its tools.	• Screenshots of the Canva interface with labeled elements. • Guided exploration of the Canva website. • 'Canva Feature Scavenger Hunt' to locate specific tools.
		Practical Application, Creativity	Create designs using Canva templates, elements, and text.	To teach the process of creating designs using Canva's tools.	• Step-by-step guides for creating different types of designs. • Templates for creating posters, cards, and presentations. • Practice exercises for adding text, images, and elements.
		Image Manipulation, Practical Application	Learn to upload and format images in Canva.	To teach the process of incorporating and manipulating images in designs.	• Step-by-step guides for uploading images. • Practice exercises for cropping, resizing, and adjusting transparency. • Demonstrations of image animation.
		Organisation, Collaboration	Understand how to save, organise, and share Canva designs.	To teach effective design management and collaboration.	• Demonstrations of saving and creating folders. • Step-by-step guides for sharing designs. • Practice exercises for collaborating on a design.

	Reasoning	Communication	Connection	ICT Activities	Additional Strategies
	To enhance design skills by incorporating personal images.	Students will be able to upload and format images in Canva.	Relate image manipulation to editing photos in a photo album.	• Hands-on practice uploading and formatting images in Canva. • Demonstrations of image editing tools.	• Collaborative photo collage projects in Canva. • Use of online image editing tools for pre-Canva preparation.
	To promote efficient file management and collaborative skills.	Students will be able to save, organise, and share their Canva designs.	Relate saving files to organising papers in a folder, sharing to group projects.	• Hands-on practice saving, organising, and sharing designs. • Demonstrations of collaboration features.	• Collaborative design projects with real-time editing. • Use of online project management tools for design collaboration.
	To enhance design efficiency and creativity.	Students will be able to apply tips for more efficient Canva use.	Connect Canva tips to shortcuts in daily tasks.	• Hands-on practice implementing Canva tips. • Peer-to-peer sharing of Canva tips.	• Creation of digital tip sheets for Canva. • Use of screen recording tools to demonstrate Canva tips.
	To establish the importance of digital design in modern communication.	Students will be able to explain the uses of digital publishing in school and daily life.	Connect digital publishing to creating posters for school events or presentations.	• Interactive presentations showcasing digital design examples. • Short videos explaining digital publishing.	• Use of online collaborative boards to brainstorm digital design ideas. • Digital portfolios showcasing student work.
	To build a foundation for understanding visual communication.	Students will be able to identify and explain basic design principles.	Relate design principles to art and visual communication in everyday life.	• Interactive design quizzes. • Creating simple designs using basic shapes and colors.	• Use of digital drawing tools to explore design elements. • Augmented reality (AR) overlays for design element identification.
	To build familiarity with a user-friendly digital design tool.	Students will be able to navigate and use the basic features of Canva.	Relate Canva features to real-world design tools (e.g., templates as stencils).	• Hands-on practice with Canva accounts. • Interactive tutorials on Canva features.	• Virtual Canva tours with interactive annotations. • Gamified Canva feature exploration exercises.
	To develop essential digital design skills.	Students will be able to create simple designs using Canva.	Connect Canva design to creating posters, cards, or invitations.	• Hands-on practice creating designs in Canva. • Demonstrations of text effects and element manipulation.	• Collaborative design projects in Canva. • Use of online design feedback tools.
	To enhance design skills by incorporating personal images.	Students will be able to upload and format images in Canva.	Relate image manipulation to editing photos in a photo album.	• Hands-on practice uploading and formatting images in Canva. • Demonstrations of image editing tools.	• Collaborative photo collage projects in Canva. • Use of online image editing tools for pre-Canva preparation.
	To promote efficient file management and collaborative skills.	Students will be able to save, organise, and share their Canva designs.	Relate saving files to organising papers in a folder, sharing to group projects.	• Hands-on practice saving, organising, and sharing designs. • Demonstrations of collaboration features.	• Collaborative design projects with real-time editing. • Use of online project management tools for design collaboration.

Chapter	No. of Periods	Core Competencies	Learning Objectives	Teaching Objectives	Additional Resources	
		Practical Application, Efficiency	Learn tips for using Canva effectively.	To improve student workflow within Canva.	• List of Canva tips and tricks. • Demonstrations of keyboard shortcuts and efficient tool usage. • Practice exercises implementing the tips.	
5. Cloud Computing	7	Conceptual Understanding, Critical Thinking	Understand the concept of cloud computing and its benefits/ drawbacks.	To introduce cloud computing as a modern technology and its impact.	• Simple explanations of cloud computing using analogies (e.g., electricity grid). • Visual aids showing cloud computing infrastructure. • Discussion about the benefits and drawbacks of using online services.	
		Practical Application, Information Literacy	Identify and use examples of cloud computing (storage, email, software).	To demonstrate the practical applications of cloud computing.	• Examples of Google Drive, Gmail, and online software. • Real-world scenarios where cloud services are used. • Discussion about how students use cloud services daily.	
		Navigation, Organisation	Explore the Google Drive interface and file management features.	To teach the process of organising and accessing files in Google Drive.	• Screenshots of the Google Drive interface with labeled elements. • Guided exploration of Google Drive. • 'Google Drive Scavenger Hunt' to locate specific features.	
		Information Retrieval, Practical Application	Learn to apply filters and search for files in Google Drive.	To teach efficient file retrieval techniques in Google Drive.	• Step-by-step guides for applying filters and using search. • Practice exercises for finding specific files. • 'Google Drive Search Challenge' to locate files based on criteria.	
		Communication, Collaboration	Understand and practice online collaboration using Zoom.	To teach the basics of online collaboration through Zoom.	• Demonstrations of joining and using Zoom features. • Practice exercises for participating in online meetings. • Role-playing scenarios for online collaboration.	
		Social Skills, Digital Citizenship	Learn and practice online classroom etiquette.	To teach responsible and respectful online communication.	• Discussion about online classroom rules and etiquette. • Scenarios for practicing appropriate online behavior. • Role-playing exercises for online classroom etiquette.	
		Safety Awareness, Critical Thinking	Understand internet threats and practice online safety.	To teach basic online safety practices and threat awareness.	• Posters illustrating common internet threats. • Scenarios for identifying phishing emails and cyberbullying. • Discussion about password protection and online safety tips.	

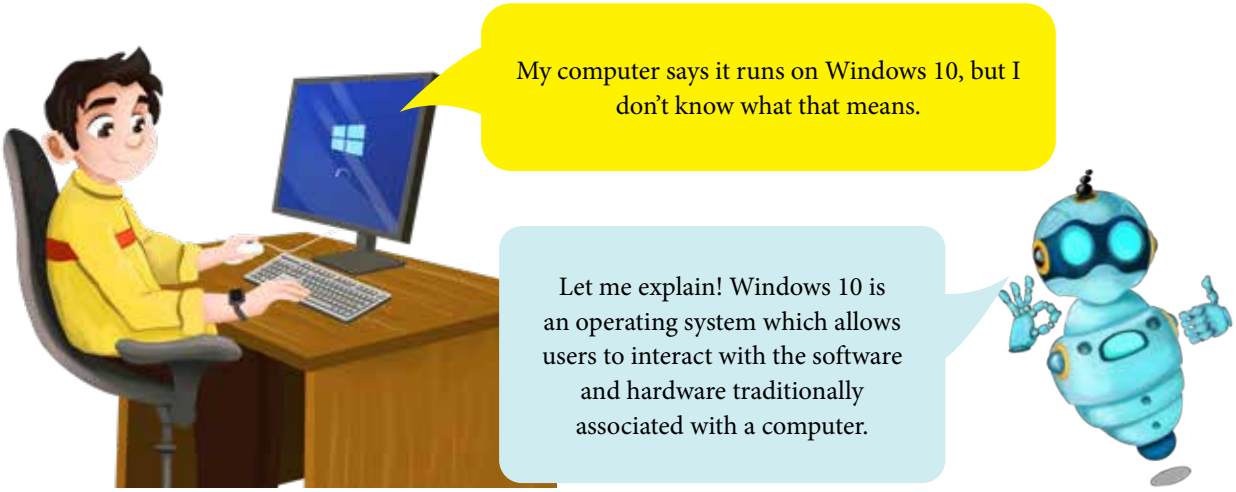
	Reasoning	Communication	Connection	ICT Activities	Additional Strategies
	To enhance design efficiency and creativity.	Students will be able to apply tips for more efficient Canva use.	Connect Canva tips to shortcuts in daily tasks.	• Hands-on practice implementing Canva tips. • Peer-to-peer sharing of Canva tips.	• Creation of digital tip sheets for Canva. • Use of screen recording tools to demonstrate Canva tips.
	To build a foundational understanding of cloud-based services.	Students will be able to explain what cloud computing is and identify its pros and cons.	Relate cloud computing to storing things in a shared, accessible space.	• Interactive presentations explaining cloud computing concepts. • Short videos demonstrating cloud services.	• Use of digital concept maps to illustrate cloud computing. • Collaborative online discussions about cloud service usage.
	To familiarise students with the everyday use of cloud-based tools.	Students will be able to identify and give examples of cloud computing services.	Connect cloud services to familiar online activities (e.g., watching videos, playing online games).	• Hands-on practice with Google Drive and Gmail. • Demonstrations of online software applications.	• Virtual tours of cloud data centers (if available). • Gamified cloud service identification exercises.
	To build familiarity with a widely used cloud storage platform.	Students will be able to navigate Google Drive and manage files and folders.	Relate Google Drive folders to physical filing cabinets and files to documents.	• Hands-on practice with Google Drive accounts. • Interactive tutorials on Google Drive features.	• Virtual Google Drive tours with interactive annotations. • Collaborative file organisation projects in Google Drive.
	To enhance file management efficiency in a digital environment.	Students will be able to efficiently find files using filters and search.	Connect Google Drive search to searching for books in a library catalog.	• Hands-on practice applying filters and searching in Google Drive. • Demonstrations of different search operators.	• Collaborative file organisation projects using search and filters. • Use of online search simulation tools.
	To develop essential online communication and collaboration skills.	Students will be able to join and participate in Zoom meetings.	Relate Zoom meetings to group discussions and presentations in a classroom.	• Hands-on practice joining and participating in Zoom meetings. • Demonstrations of screen sharing and chat features.	• Collaborative projects using Zoom breakout rooms. • Use of online collaboration tools integrated with Zoom.
	To foster responsible digital citizenship and online communication skills.	Students will be able to demonstrate online classroom etiquette.	Relate online classroom etiquette to classroom behavior.	• Interactive discussions about online etiquette. • Creating online etiquette guidelines.	• Use of digital role-playing scenarios to practice online etiquette. • Peer feedback sessions on online behavior.
	To foster responsible digital citizenship and online safety.	Students will be able to identify and describe internet threats.	Relate online safety to real-world safety (e.g., stranger danger).	• Interactive quizzes on internet safety and threat awareness. • Demonstrations of antivirus software and password protection.	• Use of simulated phishing emails and cyberbullying scenarios for practice. • Creating online safety guides (posters or digital documents).

Chapter	No. of Periods	Core Competencies	Learning Objectives	Teaching Objectives	Additional Resources	
6. Introduction to coding and AI	9	Conceptual Understanding, Curiosity	Understand the basic definition of Artificial Intelligence (AI).	To introduce the concept of AI and its relevance in daily life.	• Simple definitions of AI using relatable examples. • Visual aids showing AI applications. • Discussion about AI in movies and cartoons.	
		Practical Application, Observation	Identify and understand AI applications in daily life.	To demonstrate the practical applications of AI in everyday contexts.	• Examples of voice assistants, personalized search results, and recommendation systems. • Discussion about how AI impacts their online experiences. • 'AI Scavenger Hunt' to find AI in everyday technology.	
		Analytical Thinking, Logical Reasoning	Understand how AI works through machine learning and pattern recognition.	To introduce the concepts of machine learning and pattern recognition in a simplified manner.	• Simple analogies for machine learning (e.g., teaching a dog tricks). • Visual aids showing pattern recognition examples. • Hands-on activities with pattern recognition puzzles.	
		Practical Application, Information Literacy	Explore the uses of machine learning in daily life.	To demonstrate the practical applications of machine learning.	• Examples of internet search results, spam filters, and recommendation systems. • Discussion about how machine learning improves online experiences. • 'Machine Learning Scavenger Hunt' to find machine learning in everyday technology.	
		Coding Skills, Problem Solving	Learn to train an AI bot using Code.org lessons.	To introduce basic coding and AI training through Code.org.	• Guided tutorials on Code.org's AI lessons. • Practice exercises for training AI bots. • 'AI Bot Training Challenge' to optimize bot performance.	
		Critical Thinking, Ethical Awareness	Understand the strengths and limitations of machine learning, including data bias.	To introduce the ethical considerations of AI and machine learning.	• Examples of successful and unsuccessful machine learning applications. • Discussion about data bias and its impact. • Scenarios for identifying biased data.	
		Practical Application, Information Literacy	Explore AI applications in maps, chatbots, recommendations, and self-driving cars.	To demonstrate the diverse applications of AI in various fields.	• Examples of AI-powered maps, chatbots, and self-driving cars. • Discussion about how AI improves these technologies. • 'AI Application Exploration' to research and present AI uses.	
		Coding Skills, Creativity	Learn basic coding concepts using Code.org's Sprite Lab.	To introduce basic coding concepts through a visual programming environment.	• Guided tutorials on Code.org's Sprite Lab interface. • Practice exercises for creating animations and interactions. • 'Sprite Lab Creation Challenge' to design a creative project.	
		Information Literacy, Spatial Reasoning	Understand digital age mapping and location data.	To introduce the concepts of digital mapping and location-based services.	• Examples of digital maps and location-based apps. • Discussion about how location data is used. • Hands-on activities with digital maps.	

	Reasoning	Communication	Connection	ICT Activities	Additional Strategies
	To build a foundational understanding of AI as a technology.	Students will be able to explain what AI is and give examples of its applications.	Connect AI to things that seem 'smart' or that can 'learn.'	• Interactive presentations explaining AI concepts. • Short videos demonstrating AI applications.	• Use of digital storyboards to illustrate AI scenarios. • Collaborative online discussions about AI in media.
	To familiarise students with the pervasive nature of AI.	Students will be able to identify and explain how AI is used in daily life.	Connect AI to familiar online experiences (e.g., using voice commands, seeing recommended videos).	• Hands-on exploration of voice assistants and search engines. • Demonstrations of recommendation systems on streaming platforms.	• Virtual tours of AI-powered facilities (if available). • Gamified AI application identification exercises.
	To build a basic understanding of how AI learns.	Students will be able to explain how AI learns through machine learning and pattern recognition.	Relate machine learning to learning from experience and pattern recognition to identifying similarities.	• Interactive pattern recognition games. • Simple machine learning simulations.	• Use of digital pattern recognition tools. • Collaborative pattern identification projects.
	To familiarise students with the impact of machine learning.	Students will be able to give examples of machine learning applications.	Connect machine learning to improving online tools and services.	• Hands-on exploration of spam filters and recommendation systems. • Demonstrations of auto-complete and voice recognition features.	• Virtual tours of data centers and AI research facilities (if available). • Gamified machine learning application identification exercises.
	To build basic coding and AI training skills.	Students will be able to train a virtual AI bot.	Relate training an AI bot to teaching a pet or a child.	• Hands-on practice with Code.org's AI lessons. • Demonstrations of different training strategies.	• Collaborative AI bot training projects. • Use of online coding environments for AI training.
	To foster critical thinking about AI and its ethical implications.	Students will be able to discuss the strengths and limitations of machine learning and identify data bias.	Relate data bias to unfairness in real-world situations.	• Interactive discussions about AI ethics. • Case studies of AI failures due to data bias.	• Use of online simulations to explore data bias. • Collaborative projects to identify and mitigate bias.
	To familiarise students with the diverse applications of AI.	Students will be able to give examples of AI in maps, chatbots, recommendations, and self-driving cars.	Connect AI applications to improving daily life and solving complex problems.	• Hands-on exploration of AI-powered maps and chatbots. • Demonstrations of self-driving car simulations.	• Virtual tours of AI-powered transportation and customer service facilities (if available). • Collaborative research and presentation projects on AI applications.
	To build basic coding and problem-solving skills.	Students will be able to create simple programs in Sprite Lab.	Relate coding to giving instructions to a computer.	• Hands-on practice with Code.org's Sprite Lab. • Demonstrations of different coding blocks.	• Collaborative coding projects in Sprite Lab. • Use of online coding communities for sharing and feedback.
	To build understanding of how location data is used in the digital age.	Students will be able to describe digital age mapping and location data.	Relate digital mapping to traditional maps and location data to finding places.	• Hands-on exploration of digital maps and location-based apps. • Demonstrations of how location data is used in navigation.	• Virtual tours of digital mapping facilities (if available) • Collaborative projects to create digital maps.

CHAPTER 1

LEARNING ABOUT THE OPERATING SYSTEM



Learning Objectives

Students will be able to:

- define what an Operating System is.
- identify Windows 10 as a type of Operating System.
- describe the basic uses and differences between Operating System versions.
- label the key components of the Windows 10 desktop interface.
- demonstrate the use of search and shortcuts for navigation in Windows 10.

Lesson Plan 1

Topics: Windows OS; Windows 10 desktop; Quick Access

Page number: 2-3

Core Competencies

- **Critical Thinking and Problem Solving**: Analysing the function of an Operating System and troubleshooting basic navigation issues.
- **Communication and Collaboration**: Discussing concepts and sharing discoveries during activities.
- **Digital Literacy**: Understanding and using basic computer interface elements and navigation tools.
- **Self-Management**: Organising digital space (desktop organisation task).

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Resources

- Projector/Interactive Whiteboard (if available)
- Computers with Windows 10 (or screenshots/simulations if computers are limited)
- Worksheets with desktop interface diagrams for labeling
- Markers/Pens
- Optional: Online interactive desktop simulations

Teaching Methodology

- **Introduction**

  Begin with a class discussion using the analogy of a school principal. Employ questioning techniques to elicit student understanding of management and organisation. Ask: What happens if a school has no principal? This will lead to the idea of a central manager.

- **Guided Practice**

  Ast students to work in pairs to discuss and write down how an OS would assist in given scenarios. Each pair will present their scenario and explanation to the class.

  Show the students the video for OS from Keyboard Book 4 digital assets. As a class, brainstorm a list of tasks that an OS performs. Write these on the board. Using the following flow chart, help students understand the actions and role of OS. Then, apply that understanding to a task they listed and present it to the class.

- **Interactive Exploration**

  Display a timeline of Windows versions. Highlight key visual and functional differences. Use side-by-side comparisons of interface screenshots. Provide students with images of different Windows versions. Ask them to identify key differences and explain possible improvements in newer versions. Conduct a quick exit ticket activity. Students write down one thing they learned about Operating Systems.

  FLOW CHART FOR OS

  1. User Interaction: You double-click the Paint icon on the desktop using the mouse.
  2. Is Input for OS or Application: The OS recognises this as a request to open an application (Paint).
  3. OS Sends Input to Application: The OS tells the computer to open the Paint program.
  4. Does the Application Need Hardware? Paint needs the screen to display and memory to run.
  5. OS Manages Hardware: The OS allocates screen space and memory for Paint.
  6. Hardware Executes Task: The screen displays the Paint window.
  7. OS Receives Hardware Response: The OS confirms that the Paint window is open.
  8. OS Updates User Interface/Application Output: The Paint window appears on the screen.
  9. User Sees Result: You see the Paint program ready.

- **Activity - Desktop Treasure Hunt**

  Ask students to study the screenshot of the desktop on page 3 and then verbally give students clues to find items on the desktop image. Ask students for examples of when they need to search for something on a computer. Demonstrate search functionality and shortcut creation (if appropriate).

Explain the concept of indexing and how it speeds up search. Provide a list of search terms (e.g., paint, settings). Ask students to practise using the search bar in the labs to understand the Quick Access tool.

- **Wrap-up Assessments**

  Students can also be tasked with answering questions 3a and 3b on page 9.

Performance Indicators

Students can:

- accurately define an Operating System in their own words.
- correctly identify Windows 10 as a specific type of Operating System.
- list at least two differences between older and newer Windows OS versions.
- accurately label at least five key components of the Windows 10 desktop.
- successfully use the search function to locate specified files or applications.
- explain the purpose of desktop shortcuts and how they aid in navigation.
- complete the desktop organisation task with minimal prompting.

Lesson Plan 2

Topics: Task Manager - Understanding Your Computer's Engine

Page number: 4

Core Competencies

- **Problem-solving:** Analyse data within the Task Manager to identify performance issues and develop the ability to troubleshoot slowdowns and resource bottlenecks.
- **Critical thinking**: analyse data from the Task Manager to conclude system performance; differentiate between normal and abnormal resource usage.
- **Digital literacy**: practical experience navigating a core system utility; interpreting technical information in a graphical user interface.
- **Systems thinking**: Understand how different processes and resources interact within a computer system and learn to see the computer as a complex, interconnected system.

Learning Outcomes

Students will be able to:

- identify and explain the basic functions of the Task Manager.
- interpret key performance metrics (CPU, Memory, Disk).
- manage startup programs.
- understand the concept of processes running on a computer.

Resources

- Computers with Windows 10
- Projector/Smartboard
- Handout with key terms and performance metric definitions (CPU, Memory, Disk)
- Simple startup program simulation (e.g., a shortcut that opens a basic program).

Methodology

- **Introduction**

  Begin by asking students to imagine your computer is a busy city. What things need to happen for the city to run smoothly? (Relate to processes). Explain that the Task Manager is like a control centre showing everything inside the computer. Ask students to familiarise themselves with the Task Manager's layout and the meaning of CPU, Memory, and Disk usage. Understand how startup programs impact system performance. Show students how to open the Task Manager (Ctrl + Shift + Esc).

- **Guided Practice**

  Guide students through the Processes tab. Explain the column headers (Name, CPU, Memory, Disk). Use simple examples: Which process is using the most CPU right now? What does that mean? (High CPU means the process is working hard). Use relatable analogies. For example, the CPU is like the brain, Memory is like the short-term workbench, and the Disk is like long-term storage.

- **Interactive Exploration**

  Have students explore the Performance tab. Discuss how the graphs change as they open and close different programs. Simulate a startup program. Create a shortcut to a simple program and place it in the startup folder. Show students how to disable it in the Task Manager's Startup tab. Have students predict what will happen before they open different programs and observe the performance tabs.

- **Challenge Task**

  Present a scenario; for example, if your computer is running slowly, what will you do on the Task Manager to identify what might be causing the problem? Students should identify high CPU or Memory usage as a potential cause.

- **Wrap-Up Assessment**

  Ask students: What is the Task Manager used for? What are two important things you can see in it? Students can also be tasked with answering question 3c and Application-based questions on page 9.

Performance Indicators

Students can:

- correctly open the Task Manager.
- explain the basic functions of the Processes and Performance tabs.
- identify and interpret key performance metrics.
- disable a startup program.

Lesson Plan 3

Topics: Working Flexibly with Windows - Task View & Tablet Mode

Page number: 5-6

Core Competencies

- **Adaptability**: Students can switch between user interfaces based on their needs and devices. They will develop flexibility in their approach to using technology.
- **Digital fluency**: Students will become proficient in using advanced features of the Windows 10 operating system. They will expand their understanding of how to interact with digital devices.
- **User interface understanding**: Students recognise and navigate different user interface elements and will develop an understanding of how user interfaces are designed to facilitate interaction.
- **Exploration**: Students will explore and discover the features of Windows 10 and learn through hands-on experience.

Learning Outcomes

Students will be able to:

- use Task View to manage multiple windows.
- understand the purpose and functionality of Tablet Mode.
- switch between Task View and Tablet Mode.

Resources

- Computers with Windows 10 (some with touchscreens if possible)
- Projector/Smartboard
- Visual aids showing Task View and Tablet Mode interfaces.

Methodology

- **Introduction**

  Ask students to read pages 5-6: How do you organise your toys or school supplies when you have many of them? (This question relates to managing multiple windows.) Explain that Task View helps to organise open windows, while Tablet Mode alters the interface for touchscreen devices. Teacher Background Information: Understand the advantages of Task View for multitasking and Tablet Mode for touch-based interaction. Demonstrate Task View and Tablet Mode using the projector.

- **Guided Practice**

  Open multiple programmes and demonstrate how to use Task View to switch between them. If feasible, showcase Tablet Mode on a touchscreen device. Illustrate how the Start menu and app icons alter. Utilise clear visual cues and step-by-step instructions. Allow sufficient time for students to practise.

- **Interactive Exploration**

  Have students practise using Task View to manage their open windows. If applicable, allow students to explore Tablet Mode and its features. Encourage students to experiment and discover how these features can assist them.

  Inquire with students about their actions if they had multiple research windows open for a project. Utilise Task View to organise them and locate a specific window. Students may propose switching to tablet mode and employing a drawing application if relevant.

- **Wrap-Up Assessment**

  Ask students: What is Task View used for? When would you use Tablet Mode? As an exit ticket, ask students to draw a simple picture of either the Task View or the Tablet Mode button. Students can also be tasked with answering questions 3d and In the lab activity from page 9.

Performance Indicators

Students can:

- use Task View to switch between windows.
- explain the purpose of Task View and Tablet Mode.
- switch between desktop and tablet mode.

Lesson Plan 4

Topics: Troubleshooting in Windows 10

Page numbers: 6-7

Core Competencies:

- **Problem-solving**: Students identify and address common computer problems systematically and develop the ability to apply logical reasoning to troubleshooting.
- **Critical thinking**: Students evaluate different troubleshooting options and select the most appropriate solution. They will also learn to prioritise troubleshooting steps based on the severity of the problem.
- **System maintenance**: Students will learn to perform basic maintenance tasks and understand the importance of regular computer maintenance to ensure optimal performance.
- **Resilience**: Students learn that problems occur and can be solved. They will learn to stay calm and follow steps to resolve issues.

Learning Outcomes

Students will be able to:

- identify common computer problems.
- learn basic troubleshooting steps (restart, check updates, free up disk space).
- understand the importance of system maintenance.

Resources

- Computers with Windows 10
- Projector/Smartboard
- Handout with troubleshooting steps and visual aids.

Methodology

- **Introduction**

  First off, familiarise yourself with the troubleshooting steps: disk cleanup, malware scans, update checks, and the importance of restarting. In he class, ask students to read pages 6 and 7 from the textbook and then brainstorm. Ask: What do you do when your toys or tools stop working properly? (Relate this to troubleshooting). Explain that computers sometimes have problems, and troubleshooting helps fix them. Share a simple story of a computer problem and how it was resolved.

- **Guided Practice**

  Show how to restart a computer and how to check for Windows updates. Point out where the disk cleanup tool can be found. It's important to emphasise that a simple restart can often be the quickest and most effective way to resolve many issues.

- **Interactive Exploration**

  Guide students in checking for updates and clearing disk space, if necessary. Discuss the significance of running antivirus software without conducting a scan in class, should that be prohibited. Employ visual aids and provide step-by-step instructions. Encourage students to ask questions.

  Ask students what they would do if their computer was running slowly, and they received a message saying, 'Low Disk Space.' What steps would they take? Students should be advised to restart and free up disk space.

- **Wrap-Up Assessment**

  Ask students: What are two troubleshooting steps you can take to fix a computer problem? As an exit ticket, ask students to write one thing they can do to keep their computer running smoothly. Students can also be tasked with answering questions 1, 2, 3e and Group Project on page 9.

Performance Indicators

Students can:

- identify common computer problems.
- explain basic troubleshooting steps.
- do basic computer maintenance.

IN THE LAB

Activity

Make a list of tasks that could be done faster if someone were to use multiple desktops. Choose one of the tasks and perform them on a computer. Have a partner note the time it would take to do the task using multiple desktops as compared to a single desktop.

Instructions

- Explain what multiple desktops are and how they can help organise tasks.
- Ask students to list tasks that could be done faster using multiple desktops. Examples:
  - Writing a report while researching online.
  - Editing a photo while listening to music.
  - Coding a program while testing it in another window.
- Each student chooses one task from their list.
- Ask students to perform the chosen task using a single desktop. Time how long it takes. Ask students to perform the same task using multiple desktops. Time how long it takes. Record the times for both methods.
- Compare the times recorded for both methods.
- Discuss which method was faster and why.

APPLICATION BASED QUESTIONS

Activity 1

Write the Software name in the Task Manager that uses the most memory.

Instructions

- Explain the importance of monitoring memory usage on a computer.
- Discuss how high memory usage can affect computer performance.
- Instruct students to open Task Manager by pressing **Ctrl + Shift + Esc**.
- Ensure all students have Task Manager open on their screens.
- Direct students to click on the **Processes** tab in Task Manager.
- Explain the columns and what they represent, focusing on the **Memory** column.
- Ask students to look at the Memory column and identify which software is using the most memory.

- Have students write down the name of the software using the most memory.
- Discuss why certain software might use more memory than others.
- Talk about ways to manage memory usage, such as closing unnecessary programs.

Activity 2

Imagine you are working on a school project and your computer freezes. How would you use the Task Manager to solve this problem?

Instructions

- Discuss the role of the Task Manager in resolving such issues.
- Instruct students to open Task Manager by pressing **Ctrl + Shift + Esc**.
- Ensure all students have Task Manager open on their screens.
- Explain how to identify a program that is not responding (it might say 'Not Responding' next to it).
- Ask students to look for any programs that are not responding.
- Instruct students to click on the unresponsive program to select it.
- Show them how to click the **End Task** button at the bottom-right corner of Task Manager.
- Explain that this should close the unresponsive program and free up their computer.
- Discuss what to do if ending the task does not resolve the issue (e.g., restarting the computer).
- Talk about preventive measures to avoid computer freezes, such as regular updates and avoiding running too many programs at once.

GROUP PROJECT

Activity

Research the life and work of Bill Gates, the founder of Microsoft, and his impact on the history of computer science. Create a presentation and share it with the class, highlighting the significance of his achievements in today's world.

Instructions

- Divide the class into small groups (3-4 students per group).
- Provide each group with the following research topics:
  a. Early life and education of Bill Gates.
  b. Founding of Microsoft and key milestones.
  c. Major achievements and contributions to computer science.
  d. Philanthropic efforts and the Bill & Melinda Gates Foundation.
  e. Impact on modern technology and society.

- Encourage students to use reliable sources. Instruct each group to organise their research findings into a coherent structure for their presentation.
- Suggested structure:
  a. Introduction
  b. Early Life
  c. Founding of Microsoft
  d. Achievements and Contributions
  e. Philanthropy
  f. Impact on Technology and Society
  g. Conclusion
- Guide students to create their presentations using PowerPoint, Google Slides, or another tool.
- Ensure each group includes images, key points, and relevant information in their slides.
- Encourage creativity and clarity in their presentations.
- Allow each group to rehearse their presentation.
- Provide feedback on their delivery, slide design, and content.
- Each group should present their findings to the class.
- Encourage students to ask questions and engage with the presenters.
- After all presentations, lead a class discussion on the impact of Bill Gates and his contributions to computer science.
- Ask students to reflect on what they learned and how it applies to today's technology.

Engagement Activities

Windows OS Versions Timeline

- Students can draw or use a digital tool to create a timeline, adding key features to each version.

Desktop Interface Labelling

- Provide a blank desktop screenshot and ask students to label items like the Start Menu, Taskbar, and System Tray.

Quick Access Search Race

- Give students a list of items to find using the Windows search feature. The fastest student to find all the items wins.

Shortcut Navigation Challenge

- Teach students common keyboard shortcuts and have them complete tasks using only shortcuts.

Task Manager Exploration

- Open Task Manager and identify different tabs (Processes, Performance, Startup). Discuss what each tab shows.

Task View and Tablet Mode Demo

- Show how to switch between Task View and Tablet Mode. Let students try it on a device.

Troubleshooting Scenarios

- Present common problems (e.g., slow computer, full disk) and ask students to suggest troubleshooting steps.

Disk Space Cleanup:

- Guide students through freeing up disk space using the Settings menu.

Malware Check Role-Play

- Role-play a scenario where students act as IT support, running a malware scan and explaining the steps.

System Performance Monitoring

- Use Task Manager to monitor system performance and discuss what the metrics mean.

Would You Rather Brainstorming

- Would you rather use a computer with only a mouse or keyboard? Why?
- Would you rather have a computer that starts up instantly but has no internet, or one that takes a

long time to start but has super-fast internet? Why?

- Would you rather troubleshoot a computer problem yourself or ask a friend for help? Why?

Applied Scenario-Based Questions

- Your computer is running very slowly. What steps would you take using Task Manager to identify and fix the problem?
- You need to switch between multiple applications quickly. How would you use Task View to manage your open windows?
- You notice that your computer's disk space is almost full. What steps would you take to free up space?
- Your computer has been acting strangely, and you suspect it might have malware. What steps would you take to check for and remove malware?

Riddles with Answers

1. I help you see all the programs on your computer and can end tasks causing problems. What am I?

   Answer: Task Manager.

2. I am a mode that makes using your device with touch easier. You can switch to me from the Action Centre. What am I?

   Answer: Tablet Mode.

3. I am a feature that lets you quickly switch between open windows and desktops. You can access me by pressing Windows + Tab. What am I?

   Answer: Task View.

Answer for Exercise

1. Fill in the blanks

1. Operating
2. Task Manager
3. Action Centre
4. Malware
5. Storage

2. True or false

1. False
2. True
3. True
4. False
5. False

3. Answer the questions

a. An operating system (OS) manages all the hardware and software on a computer. It helps the computer run programs and allows users to interact with the computer. Without an OS, a computer wouldn't be able to function properly.

b. The answers will vary. Have students mention using Windows 10 on a tablet and how they navigated the touch-friendly interface.

c. The answers will vary.

d. The answers will vary. Make sure students add examples to support their answers.

e. To troubleshoot common problems in Windows 10, one can:

   1. Restart the computer.
   2. Check for updates.
   3. Run a virus scan.
   4. Use the built-in troubleshooter. These steps are effective because they help identify and fix issues, ensuring the computer runs smoothly.

CHAPTER
2

EMAIL COMMUNICATION

Why is email an essential communication tool in today's digital age?

It's versatility, accessibility, and ability to reach a wide audience efficiently makes email popular for communication.

Learning Objectives

Students will be able to:

- understand the purpose and importance of email.
- navigate the Gmail interface.
- identify key features of Gmail.

Lesson Plan 1

Topic Understand Email; starting Gmail; Gmail features

Page number 10-12

Core competencies

- **Digital Literacy**: Students are learning to navigate and understand a digital tool (Gmail), building essential skills for using technology.
- **Communication**: They learn about a fundamental communication tool and its purpose.
- **Information Management**: They are introduced to organising and finding information within a digital platform.
- **Global Awareness**: They understand that email allows communication across geographical boundaries.

Resources

- Computers with internet access and Gmail accounts (or simulated Gmail interface)
- Projector/Smartboard

- Visual aids of the Gmail interface
- Handout with key Gmail terms

Methodology

- **Introduction**

  Understand the history of email and its evolution. Familiarise yourself with the Gmail interface and its various features. Begin by discussing how people communicate with each other (letters, phone calls, etc.). Explain that email is a way to send messages electronically. Discuss the advantages of email: global reach, file sharing, and being eco-friendly (less paper). Show a brief video or visual of how email travels across the internet.
- **Guided Practice**

  Guide students through the Gmail interface. Show them the grid icon app launcher, the left menu pane, the inbox, chat, and spam filtering. Explain the concept of labels and conversation view. Use clear visual cues and step-by-step instructions. Use analogies; for example, the inbox is like a mailbox, and spam is like unwanted junk mail.
- **Interactive Exploration**

  Have students explore the Gmail interface. Encourage them to use the search function and explore the different sections of the left menu pane. Show how the side panels work. Allow students to experiment and discover how these features can help them. Provide a scenario: 'Find an email from a specific sender or with a specific keyword using the search function.' Have students identify the spam folder.
- **Wrap-Up Assessment**

  Ask: 'What are two advantages of using email? What is one feature of Gmail you learned today?' Ask students to draw a simple picture of the Gmail inbox as an exit ticket.

Performance Indicators

Students can:

- explain the purpose of email.
- navigate the Gmail interface.
- identify key Gmail features.

Lesson Plan 2

Topic: Composing and Formatting Emails

Page numbers: 13-14

Core Competencies

- **Written Communication**: Students are practicing clear and effective written communication.
- **Digital Expression**: They are learning to express themselves creatively using digital tools and formatting options.
- **Attention to Detail**: They are developing the ability to pay attention to details in their writing and formatting.

Learning Outcomes

Students will be able to:

- compose a basic email.
- use text formatting options in Gmail.

Resources

- Computers with internet access and Gmail accounts
- Projector/Smartboard
- Visual aids of the 'Compose' window
- Handout with text formatting options

Methodology

- **Introduction**

  Recognise the importance of professional email etiquette to guide students effectively. Instruct students to read pages 13-14. Start by reviewing the components of an email (To, Cc, Subject, Body). Utilise an analogy to aid students' understanding: 'Consider an email as a letter. The 'To' field represents the recipient's address, 'Cc' is akin to sending a copy to someone else, the 'Subject' is the title of your letter, and the 'Body' is the main message.' Discuss the significance of a clear subject line and courteous language. Provide examples of effective and ineffective email subject lines to illustrate your point.

- **Guided Practice**

  Guide students through the 'Compose' window in Gmail. Show them where to locate each section of the email interface. Demonstrate how to utilise text formatting options such as bold, italics, underline, font size, and colour. Use an analogy: 'Formatting text is like decorating a cake. You can make certain parts stand out with different colours and styles.' Emphasise the importance of clear and concise writing. Explain that, just like in a conversation, being clear aids the reader in understanding the message better.

- **Interactive Exploration**

  Have students compose a simple email to a classmate or the teacher. Provide a prompt or topic for the email, such as 'Write an email inviting a friend to your birthday party.' Encourage students to utilise various text formatting options to make their emails more engaging. Move around the classroom, offering assistance and feedback as needed.

  Ask students to write an email with a specific formatting request, such as 'Make the subject line bold' or 'Use italics for the main points.' This task will help students practice using formatting options purposefully.

- **Wrap-Up Assessment**

  Review the essential components of an email and the formatting options discussed. Ask students, 'What are the main elements of an email? What are two text formatting options you can utilise?' Have students write a brief email subject line on paper and submit it as they leave. Students can also be tasked with answering questions 2a and 2d on page 19 and attempt the Group project on page 20.

Performance Indicators

Students can:

- navigate the 'Compose' window in Gmail.
- Students can use text formatting options effectively.
- Students understand the importance of clear subject lines and polite language in emails.

Lesson Plan 3

Topics: Attachments and Forwarding Emails

Page numbers: 15-16

Core Competencies

- **Information Sharing:** Students are learning to share digital files and information.
- **Process Following:** They are developing the ability to follow step-by-step instructions.
- **Digital Organisation:** They are learning to manage and organise digital information.

Learning Outcomes

Students will be able to:

- attach files to emails.
- forward emails.

Resources

- Computers with internet access and Gmail accounts
- Projector/Smartboard
- Sample files for attachment
- Example emails for forwarding

Methodology

- **Introduction**

  Start by explaining the concept of attaching files to emails. You can use an analogy to help students understand: 'Attaching a file to an email is like putting a photo or document in an envelope before mailing it.' This will help them visualise the process. Discuss why attaching files and forwarding emails are helpful. For example, attaching a document can help share homework, and forwarding an email can help pass on important information. It's also important to talk about file size limits and different file formats (e.g., PDF, JPEG, DOCX). Explain that some email providers have limits on the size of attachments. Show examples of appropriate situations for forwarding emails, such as sharing a newsletter or passing on a message from a teacher.

- **Guided Practice**

  Demonstrate how to attach a file to an email. Use a step-by-step approach:

  a. Open the email compose window.
  b. Click on the attachment icon (usually a paperclip).
  c. Select the file you want to attach from your computer.

4. Ensure the file is attached and visible in the email.

   Next, show how to forward an email:

   a. Open the email you want to forward.
   b. Click on the forward button.
   c. Enter the recipient's email address.
   d. Add any additional message if needed.
   e. Click send.

   Emphasise the importance of clear instructions and double-checking attachments before sending.

- **Interactive Exploration**

  Have students practice attaching files and forwarding emails. Provide specific scenarios for them to work on, such as attaching a homework document and sending it to the teacher or forwarding a class announcement to a classmate. Ask students to attach a specific file (e.g., a picture or document) and forward an email to a designated address (e.g., the teacher's email). Walk around the classroom, helping and giving feedback as needed.

  Give students a more complex task that involves specific formatting requests. For example, 'Attach a document and make sure the subject line is bold' or 'Forward an email and include a brief message explaining why you are forwarding it.' This will help students practice using formatting options purposefully.

- **Wrap-Up Assessment**

  Review the key steps for attaching files and forwarding emails. Ask students, 'How do you attach a file to an email? When would you forward an email?' For the exit ticket, have students write down one step: attach a file to an email and hand it in as they leave. Students can also be tasked with answering question 2b on page 19 and In the lab activities on page 20.

Performance Indicators

Students can:

- attach files to emails, demonstrating their understanding by completing the task without assistance.
- forward emails appropriately, showing they can follow the steps and understand the purpose of forwarding.
- identify and troubleshoot common issues related to attachments and forwarding, demonstrating problem-solving skills.

Lesson Plan 4

Topics Organising Emails with Labels

Page number 17

Core Competencies

- **Organisation:** Students are developing organisational skills in a digital context.
- **Information Management**: They are learning to manage and retrieve information efficiently.
- **Efficiency**: They are learning to use tools to improve their productivity.

Learning Outcomes

Students will be able to:

- create and use labels in Gmail to organise their inbox.

Resources

- Computers with internet access and Gmail accounts
- Projector/Smartboard

Methodology

- **Introduction**

  Begin by explaining how labels help organise emails. Use an analogy to make it relatable: 'Think of labels as folders in a filing cabinet. Just like you would put different documents into different folders to keep them organised, you can use labels to organise your emails.' Discuss the benefits of using labels, such as making it easier to find important emails and keeping your inbox tidy. Show examples of useful labels, like 'Homework,' 'Family,' 'Friends,' and 'Important.'

- **Activity: Labelling Game**

  Divide students into small groups. Give each group a set of email scenarios and blank labels. Ask them to discuss and decide which labels to create for each scenario. For example, an email from a teacher about homework could be labelled 'Homework,' while an email from a friend about a birthday party could be labelled 'Friends.'

- **Guided Practice**

  Demonstrate how to create a label in Gmail. Use a step-by-step approach:

  a. Open Gmail and go to the left menu pane.
  b. Scroll down and click on 'More' to expand the menu.
  c. Click on 'Create new label.'
  d. Enter a name for the label and click 'Create.'

  Next, show how to apply labels to emails:

  a. Select an email you want to label.
  b. Click on the label icon (it usually looks like a tag).
  c. Choose the label you created from the list.
  d. The email will now have the label applied.

  Provide clear, step-by-step instructions and ensure students follow along on their computers.

- **Interactive Exploration**

  Have students practice creating their labels and organising their emails. Provide specific scenarios for them to work on, such as:

  a. Create a label for 'School Projects' and apply it to all emails related to their projects.
  b. Creating a label for 'Family' and organising emails from family members.

  Encourage students to think of categories that make sense for their email organisation. Walk around the classroom, providing assistance and feedback as needed. Give students a more complex task that involves organising multiple emails. For example:

a. 'Create labels for 'Homework,' 'Friends,' and 'Events.' Organise your emails into these categories.'

b. 'Find five emails that belong to different categories and apply the appropriate labels.'

- **Wrap-Up Assessment**

  Review the key steps for creating and using labels. Ask students, 'How do labels help organise emails? How do you create a label?' For the exit ticket, have students write down the name of a label they would create and why they chose it. Students can also be tasked with answering question 2c on page 19.

Performance Indicators

Students can

- create labels in Gmail, demonstrating their understanding by completing the task without assistance.
- apply labels to emails appropriately, showing they can follow the steps and understand the purpose of labelling.
- explain the process of creating and using labels.

Lesson Plan 5

Topics: Computer Safety and Email Vigilance

Page numbers: 17-18

Core Competencies

- **Digital Citizenship:** Understanding responsible and ethical online behaviour.
- **Critical Thinking:** Analysing information to identify potential risks.
- **Safety Awareness:** Recognising and avoiding online threats.

Learning Outcomes

Students will be able to:

- understand the risks of malware.
- protect themselves from online threats.
- identify suspicious emails.
- understand the importance of password protection.
- understand the purpose of backing up data.

Resources

- Computers with internet access
- Projector/Smartboard
- Visual aids of malware and phishing examples
- Examples of strong and weak passwords.
- Visual example of backing up files.

Methodology:

- **Introduction**

  Discuss the concept of malware and its dangers (viruses, worms, ransomware). Explain the importance of antivirus software, backups, and trusted downloads. Understand different types of malware and phishing techniques. Show examples of phishing emails. Explain that malware can steal information, damage computers, and hold data hostage. Explain the importance of passwords and backing up data.

- **Guided Practice**

  Discuss the importance of strong passwords (length, variety of characters). Discuss how to avoid suspicious emails (phishing). Show how to identify website security (https, padlock icon). Show a simple visual example of how files are backed up. Emphasise the importance of not clicking on unknown links or attachments. Give examples of strong versus weak passwords. Explain that backing up files keeps important work safe.

- **Interactive Exploration**

  Show suspicious emails and website examples, and have students identify red flags. Discuss the importance of verifying sender information and website addresses. Have the students create a strong password and explain why it is strong. Use real-world examples and scenarios. Have students work in pairs to analyse potentially dangerous emails.

  Present a simulated phishing email and have students explain why it is suspicious. Have the students create a short list of rules to follow when receiving emails and browsing the internet. Have the students explain why it is important to back up files.

- **Wrap-Up Assessment**

  Ask: 'What are two ways to protect yourself from malware? What are some warning signs in suspicious emails? Why are strong passwords vital? Why is it important to back up your files?' Exit ticket: 'Write one rule for staying safe online and one reason for backing up your files.' Students can also be tasked with answering question 1 on page 19 and Application-based activities 1-3 on page 20.

Performance Indicators

Students can:

- identify common online threats (malware, phishing).
- explain safety precautions (antivirus, strong passwords, trusted downloads).
- recognise suspicious emails and websites.
- create strong passwords.
- explain the concept of backing up files.

IN THE LAB

Activity 1

Create a new Gmail account. Write down the steps you followed during the account creation process.

Instructions

- Explain the importance of having an email account for communication and accessing various online services.
- Encourage students to write down each step they followed during the account creation process.
- Ask students to note any challenges they faced and how they overcame them.
- Walk around the classroom to provide assistance and ensure all students successfully create their accounts.
- Discuss common issues and solutions as a class.
- Challenge students to help a classmate who is struggling with the account creation process, reinforcing their understanding and collaboration skills.

Activity 2

Compose a formal email to your teacher asking for clarification about your homework. Include a subject, greeting, message body, and closing.

Instructions

- Explain the structure of a formal email (subject, greeting, message body, closing).
- Have students compose their own formal email to the teacher, asking for clarification about their homework.
    - Subject: 'Homework Clarification'
    - Greeting: 'Dear [Teacher's Name],'
    - Message Body: 'I hope you are well. I am writing to ask for clarification about the homework assignment given on [date]. Could you please provide more details on [specific question]? Thank you.'
    - Closing: 'Sincerely, [Your Name]'
- Provide prompts or topics for the emails if needed.
- Provide feedback on their emails, focusing on the use of proper structure and polite language. Discuss any common mistakes and how to avoid them.
- Challenge students to compose a formal email to a different recipient, such as a school principal or librarian, reinforcing their understanding of formal email etiquette.

Activity 3

Attach a PDF document to an email and send it to a friend. Describe the steps you took to attach the file.

Instructions

- Explain the importance of attaching files to emails and common scenarios where this is useful.
- Have students attach a PDF document to an email and send it to a friend.
- Provide printed handouts with step-by-step instructions for reference.
- Encourage students to describe the steps they took to attach the file.
- Walk around the classroom to provide assistance and ensure all students successfully attach and send their files. Discuss any common issues and solutions as a class.
- Challenge students to attach multiple files (e.g., a PDF and an image) to an email and send it, reinforcing their understanding of the attachment process.

Activity 4

Forward an email received from your school to your parents, letting them know about an upcoming event. Explain the steps you followed.

Instructions

- Explain the purpose of forwarding emails and common scenarios where this is useful.
- Have students forward an email from the school to their parents, letting them know about an upcoming event.
- Provide printed handouts with step-by-step instructions for reference.
- Encourage students to add a brief message explaining why they are forwarding the email.
- Walk around the classroom to provide assistance and ensure all students successfully forward their emails. Discuss any common issues and solutions as a class.
- Challenge students to forward an email to multiple recipients (e.g., both parents and a sibling), reinforcing their understanding of the forwarding process.

APPLICATION BASED QUESTIONS

Activity 1

You received an email with no subject. What should you do in this situation, and why is it important?

Instructions

- Emphasise the importance of having a clear subject line in an email. Use an analogy: 'A subject line is like the title of a book; it provides an idea of the email's content.'
- Discuss why emails without a subject can be confusing and may be overlooked.
- Have students role-play receiving an email with no subject. Ask them to consider what actions they should take in this situation.
- Encourage students to reply to the email, politely requesting the sender to include a subject line for clarity. For example: 'Hi [Sender's Name], I noticed that your email lacked a subject line. Could you please include one next time? It helps me understand the purpose of the email better. Thank you!'
- Discuss the significance of subject lines and how they assist in organising and prioritising emails.
- Challenge students to create clear and concise subject lines for various email scenarios, such as 'Homework Question,' 'Birthday Party Invitation,' or 'School Event Reminder.'

Activity 2

You received an email with suspicious links and requests for personal information. What actions should you take to stay safe?

Instructions

- Explain what makes an email suspicious, such as unknown senders, suspicious links, and requests for personal information. Use an analogy: 'A suspicious email is like a stranger asking for your personal information. You need to be careful and not share anything.'
- Have students practice identifying suspicious emails by showing examples of safe and unsafe emails.
- Discuss the actions they should take if they receive a suspicious email:
  - Do not click on any links or download attachments.
  - Do not reply to the email or provide any personal information.
  - Report the email to a trusted adult or use the 'Report Spam' or 'Report Phishing' options in their email service.
- Walk around the classroom to provide assistance and ensure all students understand how to identify and handle suspicious emails.
- Challenge students to create a checklist of steps to take when they receive a suspicious email, reinforcing their understanding of email safety.

Activity 3

You have a cluttered inbox with emails from school, friends, and family. How would you use labels to organise your emails effectively?

Instructions

- Explain how labels assist in organising emails. Use an analogy: 'Consider labels to be like folders in a filing cabinet. Just as you would place various documents into separate folders to maintain organisation, you can utilise labels to sort your emails.'
- Discuss the advantages of using labels for effective email management, including the ease of finding important emails and maintaining a tidy inbox.
- Have students practice creating their labels and organising their emails. Provide specific scenarios for them to work on, such as:
  - Create a label for 'School' and apply it to all school-related emails.
  - Create a label for 'Friends' and organise emails from friends.
  - Creating a label for 'Family' and organising emails from family members.
- Walk around the classroom to provide assistance and ensure all students successfully create and apply labels. Discuss any common issues and solutions as a class.
- Encourage students to create labels for various categories and organise their emails accordingly. For instance, 'Create labels for 'Homework,' 'Events,' and 'Important.' Sort your emails into these categories.'

GROUP PROJECT

Activity

Create an informative poster about email etiquette. Email etiquette refers to the rules and guidelines for composing and sending emails respectfully and professionally. Your poster should include:

- The do's and don'ts of email communication.
- Tips for writing a clear and concise subject line.
- Examples of proper email greetings and closings.
- Guidance on how to handle attachments and file formats.
- A section on recognising and avoiding email scams.

Once the poster is complete, present it to the class and explain the importance of email etiquette.

Instructions

- Explain the concept of email etiquette and its importance in professional and respectful communication.

- Use an analogy: 'Email etiquette is like having good manners when talking to someone. It helps you communicate clearly and respectfully.'
- Divide the class into small groups (3-4 students per group).
- Assign each group the task of creating an informative poster about email etiquette.
- Provide each group with the following guidelines for their poster:
  - **The Do's and Don'ts of Email Communication:** List important rules to follow and behaviours to avoid.
  - **Tips for Writing a Clear and Concise Subject Line:** Provide examples of effective subject lines.
  - **Examples of Proper Email Greetings and Closings:** Include formal and informal greetings and closings.
  - **Guidance on Handling Attachments and File Formats:** Explain how to attach files and the importance of using the correct file formats.
  - **Recognising and Avoiding Email Scams:** Offer tips on identifying suspicious emails and staying safe online.
- Provide materials or ask students to bring it themselves, such as poster boards, markers, coloured pencils, and printed handouts with information on email etiquette.
- Allow students to use computers to research additional information and find examples.
- Have each group brainstorm and plan their poster content.
- Encourage creativity in designing the poster, using drawings, images, and clear text to convey information.
- Walk around the classroom to provide guidance and feedback as needed.
- Once the posters are complete, have each group present their poster to the class.
- Ask each group to explain the importance of email etiquette and highlight key points from their poster.
- Encourage classmates to ask questions and provide constructive feedback.
- Display the completed posters around the classroom or in a common area.
- Have a class discussion on what they learned about email etiquette and how they can apply these rules in their own email communication.

Engagement Activities

Email Etiquette Role-Play

- Have students role-play writing and responding to emails, focusing on using proper greetings, subject lines, and polite language.

Email Scavenger Hunt

- Create a list of email etiquette components (e.g., clear subject line, proper greeting, polite closing, avoiding all caps, using correct grammar).

Email Etiquette Bingo

- Create bingo cards with different email etiquette tips and rules (e.g., 'Use a clear subject line,' 'Include a greeting,' 'Avoid slang,' 'Check for spelling errors').

Email Etiquette Jeopardy

- Create a Jeopardy-style game with categories related to email etiquette (e.g., 'Subject Lines,' 'Greetings and Closings,' 'Attachments,' 'Email Safety').

Application-Based Scenario Questions

- You received an email with no subject. What should you do in this situation, and why is it important?
- You received an email with suspicious links and requests for personal information. What actions should you take to stay safe?
- Your inbox is cluttered with emails from school, friends, and family. How would you use labels to organise your emails effectively?

Riddles

a. I can be sent and received, but I am not a letter. I can contain text, images, and files, and I help people communicate better. What am I?

Answer: An email.

b. I am a part of an email that tells you what it's about. Without me, the email might be ignored or thrown out. What am I?

Answer: The subject line.

c. I am a feature in your email that helps you stay organised. You can create me to sort your messages and keep your inbox harmonised. What am I?

Answer: A label.

Answer for Exercise

1. Multiple Choice Questions:

a. Electronic mail
b. It allows global communication.
c. Block unwanted junk emails.
d. Carbon copy
e. Conversation view

2. Answer the questions:

a. The purpose of the Subject line in an email is to give the recipient a brief idea of the email. It is essential to have a clear subject because it helps the recipient understand the importance and content of the email briefly, making it more likely that they will read it promptly.

b. To attach files to an email in Gmail, follow these steps:
   1. Click on the 'Compose' button to create a new email.
   2. Click on the paperclip icon at the bottom of the compose window.
   3. Select the file you want to attach from your computer and click 'Open.'
   4. The file will be uploaded and attached to your email.
   5. You would attach a file to an email to share documents, images, or other types of files with the recipient that are relevant to the email's content.

c. Organising your emails using labels in Gmail helps you keep your inbox tidy and makes it easier to find specific emails. Labels act like folders but are more flexible because you can apply multiple labels to a single email. This helps in categorising and prioritising emails based on different criteria, such as work, personal, or urgent.

d. BCC stands for Blind Carbon Copy. When you use BCC, the email addresses of the recipients in this field are hidden from each other. You might use BCC when you want to send an email to multiple recipients without revealing their email addresses to each other, which is useful for maintaining privacy.

CHAPTER 3

CREATING DIGITAL DESIGN WITH CANVA

Design is all around us. If you visit restaurants, you must have seen the menu card they give you. Have you noticed how professionally the menu cards are designed.

You surely must have seen billboards when travelling in the city. All of these are very skillfully designed.

Learning Objectives

Students will be able to:

- Understand the concept of digital publishing and its uses for adults and students.
- Identify and apply the fundamentals of design: line, forms, balance, shape, texture, use of colour, and negative space.

Lesson Plan 1

Topics: Digital Publishing as a Creative Outlet

Pages: 21-24

Core Competencies

- **Creativity and Innovation:** Encouraging students to think outside the box and generate innovative design ideas. This competency enables students to develop their ability to generate original ideas and solutions.
- **Digital Literacy:** Ensuring students are comfortable using digital tools and platforms, such as Canva. This competency is crucial for navigating the digital world effectively and safely.
- **Critical Thinking:** Teaching students to analyse and evaluate design elements critically. This competency helps students make informed decisions and solve problems creatively.

Resources

- Computers or tablets with internet access
- Canva accounts for each student

- Projector and screen
- Sample digital designs

Methodology

- **Introduction**

  Begin with a brief discussion on what digital publishing is and its importance in today's world. Use examples like e-books, online magazines, and social media graphics to illustrate the concept. Provide examples of digital designs used in various fields, such as advertising, education, and social media. Discuss how these designs impact the viewer and the message they convey. For students with different abilities, provide visual aids and simplified explanations to ensure everyone understands the concept.

- **Digital Publishing Discussion**

  Use the analogy of 'digital storytelling' to compare digital vs. print media. Begin with the basic uses of digital publishing, including e-books and online articles. Challenge students to brainstorm innovative digital publication ideas, like interactive e-books or digital magazines. Finish with a class 'digital portfolio' showcase where students present their ideas.

- **Guided Practice**
  - Introduce the fundamentals of design, including line, form, balance, shape, texture, the use of colour, and negative space. Ask them to imagine that they're building a digital storybook or a cool website for their class. Ask them to:
  - Think of lines like roads on a map. They help the eyes move around the page. You can use lines to separate parts of your story, like drawing a line under a title or around a picture. Example: Drawing a line to separate a heading from the story below it.
  - Think of forms and shapes as the building blocks of their picture. Circles, squares, and triangles can be used to make buttons, characters, or backgrounds. Example: Using a circle for a button that says 'Next Page' or using a square for a picture frame.
  - Imagine a seesaw. You want both sides to feel even, so it doesn't tip over. In your storybook, you want to arrange pictures and words in a way that feels balanced, making it visually appealing. Example: putting a picture on one side of the page and some text on the other.
  - Think of how a bumpy rock feels different from smooth glass. You can add 'texture' to your digital storybook to make it more interesting, even if you can't actually touch it. Example: a background that looks like paper, or a button that looks like wood.
  - Think about impact of colours. Colours can evoke a range of emotions, from happiness to sadness and excitement. You can use colours to make important words stand out, or to make your storybook look bright and fun. Example: Using bright yellow for a 'Click Here!' button, or using blue for an underwater scene.
  - Think about the empty space around your pictures and words. It's like the air around a balloon. If you have too many things crowded together, it's hard to see anything! Negative space gives your eyes a break.

  Example: leaving empty space around a picture so it stands out, or not writing too much text on one line.

- Discuss with students why this is important. Tell them that these guidelines help digital stories by:
  1. **Making it Easy to Read:** If your storybook is well-designed, your friends will enjoy reading it more!
  2. **Making it Look Cool:** Good design makes your digital projects look professional and fun.
  3. **Sharing Your Ideas Clearly:** Using design helps you show your ideas in a way that everyone can understand.

Use visual aids and real-life examples to explain each element. For example, show how lines can guide the viewer's eye, how balance creates stability, and how colour can evoke emotions. Use analogies, such as comparing design elements to ingredients in a recipe, where each component contributes to the overall flavour of the design.

- **Design Element Practice**

  Create 'design element' kits with paper, colours, and shapes. Begin with basic element identification, asking students to find and name different elements in their kits. Challenge students to create designs that incorporate specific components, such as a balanced composition or a design that focuses on texture. Finish with a class critique session where students present their designs and receive feedback.

- **Interactive Exploration**

  Have students explore Canva and identify the tools and features related to the fundamentals of design. Provide a guided tour of Canva's interface, highlighting where to find different tools and features. Encourage students to experiment with creating simple designs using these elements. For instance, ask them to create a basic poster using lines and shapes, then add colours and textures to enhance their design. For students with advanced skills, challenge them to make more complex designs and explore additional features in Canva.

- **Challenge Task**

  Assign a task where students create a digital poster on a topic of their choice, incorporating at least three of the design fundamentals discussed. Encourage creativity and originality. Provide a checklist for students to ensure they include the required elements. Offer support and feedback as they work on their designs. For students who require additional support, offer one-on-one assistance and break the task down into smaller, manageable steps.

- **Wrap-Up Assessment and Exit Ticket**

  Review the students' designs and provide feedback on their use of design elements. Highlight strengths and suggest areas for improvement. Ask students to write down one thing they learned about digital publishing and one question they still have. This helps reinforce learning and identify areas that may need further clarification. Students can now answer questions 2b and e on pages 40-41 and do the application-based questions activity on page 41.

Performance Indicators

Students can:

- explain the importance of digital publishing.
- identify and apply the fundamentals of design in their projects.

Lesson Plan 2

Topic: Canva Interface and Features

Pages: 24-25

Core Competencies

- **Digital Literacy:** Ensuring students are comfortable using digital tools and platforms like Canva. This competency is crucial for navigating the digital world effectively and safely.
- **Technical Skills:** Developing students' ability to use specific tools and features within Canva. This competency enables students to become proficient in utilising technology for creative purposes.
- **Creativity:** Encouraging students to think outside the box and generate innovative design ideas. This competency helps students develop their ability to generate original ideas and solutions

Learning Outcomes

Students will be able to:

- Navigate the Canva interface and familiarise yourself with its key features.
- Use Canva's tools to create and customise digital designs.

Resources

- Computers or tablets with internet access
- Canva accounts for each student
- Projector and screen

Methodology

- **Introduction**

  Provide a brief overview of Canva and its uses for creating digital designs. Explain how Canva can be used for various projects, from school assignments to personal projects. Demonstrate the Canva interface, highlighting key features such as the create button, panels, search function, and templates. Use a live demonstration to show how to navigate the interface. For students with different abilities, provide visual aids and simplified explanations to ensure everyone understands the interface.

- **Canva Interface Exploration**

  Prepare a 'Canva adventure' checklist with feature locations. Begin with basic navigation, guiding students through the main features of Canva. Challenge students to find hidden features, such as specific templates or design elements. Conclude with a 'Canva expert' certification, where students demonstrate their proficiency in the interface.

- **Guided Practice**

  Walk students through the process of starting a new design in Canva. Show how to select a template, add elements, and customise the layout. Use analogies like comparing Canva to a digital art studio, where students have access to various tools and materials to create their artwork. For students who require additional support, provide step-by-step instructions and supplementary examples to reinforce their understanding.

- **Interactive Exploration**

  Allow students to explore Canva independently, experimenting with various features and tools. Please encourage them to experiment with different templates and design elements. Provide a scavenger hunt activity where students must find and utilise specific features within Canva. For example, ask them to locate a particular template, add a text box, and modify the background colour. For students with advanced skills, challenge them to create more complex designs and explore additional features in Canva.

- **Challenge Task**

  Assign a task where students create a digital flyer for a school event, using at least three different Canva features. Please encourage them to be creative and consider how to make their flyer both eye-catching and informative. Provide examples of effective flyers and discuss what makes them successful. Offer support and feedback as students work on their designs. For students who require additional support, offer one-on-one assistance and break the task down into smaller, manageable steps.

- **Wrap-Up Assessment and Exit Ticket**

  Review the students' flyers and provide feedback on their use of Canva features. Highlight strengths and suggest areas for improvement. Ask students to write down one new feature they discovered and describe how they incorporated it into their design. This helps reinforce learning and encourages students to explore Canva further. For students with different abilities, provide alternative ways to express their learning, such as drawing or verbal explanations.

Performance Indicators

Students can:

- navigate the Canva interface with confidence.
- use Canva's tools to create and customise digital designs effectively.

Lesson Plan 3

Topic: Canva Editor and Basic Design Techniques

Pages: 26-29

Core Competencies

- **Digital Literacy:** Ensuring students are comfortable using digital tools and platforms, such as Canva. This competency is crucial for navigating the digital world effectively and safely.
- **Technical Skills:** Developing students' ability to use specific tools and features within Canva. This competency enables students to become proficient in utilising technology for creative purposes.
- **Creativity:** Encouraging students to think outside the box and generate innovative design ideas. This competency helps students develop their ability to create original ideas and solutions.

Learning Outcomes

Students will be able to:

- Navigate the Canva editor and understand its main features.
- Use Canva's tools to design and customise digital projects.

Resources

- Computers or tablets with internet access
- Canva accounts for each student
- Projector and screen

Methodology

- **Introduction**

  Provide an overview of the Canva editor, explaining the workspace, object panel, design elements, text tools, uploads, drawing tools, adding pages, naming, and sharing features. Use a live demonstration to show how to navigate the Canva editor. Highlight key features and explain their functions. For students with different abilities, provide visual aids and simplified explanations to ensure everyone understands the interface.

- **Guided Practice**

  Walk students through the process of designing on Canva. Show how to select templates, hover over design elements, and change the background. Use analogies like comparing the Canva editor to a digital canvas where students can paint their ideas using various tools and elements. For students who require additional support, provide step-by-step instructions and supplementary examples to reinforce their understanding.

- **Interactive Exploration**

  Allow students to explore the Canva editor on their own, trying out different features and tools. Encourage them to experiment with different design elements and templates. Provide a scavenger hunt activity where students have to find and use specific features within the Canva editor. For example, ask them to add text, upload an image, and change the background colour. For students with advanced skills, challenge them to create more complex designs and explore additional features in Canva.

- **Challenge Task**

  Assign a task where students create a digital poster using the Canva editor, incorporating at least three different features discussed. Encourage creativity and originality. Provide examples of effective posters and discuss what makes them successful. Offer support and feedback as students work on their designs. For students who need more guidance, offer one-on-one assistance and break the task into smaller, manageable steps.

- **Wrap-Up Assessment and Exit Ticket**

  Review the students' posters and provide feedback on their use of Canva features. Highlight strengths and suggest areas for improvement. Ask students to write down one new feature they discovered and describe how they incorporated it into their design. This helps reinforce learning and encourages students to explore Canva further. Students can now answer question 2d on page 40.

Performance Indicators

Students can:

- navigate the Canva editor with confidence.
- use Canva's tools to design and customise digital projects effectively.

Lesson Plan 4

Topics: Working with Images on Canva

Pages: 29-32

Core Competencies

- **Digital Literacy:** Ensuring students are comfortable using digital tools and platforms like Canva. This competency is crucial for navigating the digital world effectively and safely.
- **Technical Skills:** Developing students' ability to use specific tools and features within Canva. This competency enables students to become proficient in utilising technology for creative purposes.
- **Creativity:** Encouraging students to think outside the box and generate innovative design ideas. This competency enables students to develop their ability to generate original ideas and solutions.

Learning Outcomes

Students will be able to:

- Upload and work with images on Canva.
- Use Canva's tools to format and enhance images, including transparency, cropping, and animation.

Resources

- Computers or tablets with internet access
- Canva accounts for each student
- Projector and screen

Methodology

- **Introduction**

  Begin by explaining the importance of images in digital designs and how they can enhance the visual appeal and effectiveness of a project. Use examples from advertising, social media, and educational materials to illustrate the impact of well-chosen images. Explain that students will learn how to upload and format images in Canva, making their designs more engaging.

- **Guided Practice**

  Walk students through the process of uploading images to Canva. Demonstrate how to use the 'Uploads' tab to add images from their computer or the internet. Show how to adjust the transparency of an image to create a layered effect, like looking through a tinted window. Explain cropping by comparing it to cutting out a part of a picture with scissors to focus on the most important part. Demonstrate how to add animations to images, likening it to bringing a picture to life, similar to a flipbook.

- **Interactive Exploration**

  Allow students to explore Canva's image tools on their own. Please encourage them to upload images and experiment with transparency, cropping, and animation. Provide a scavenger hunt activity where students must find and use specific image features within Canva. For example, ask them to upload an image, adjust its transparency, crop it to focus on a specific part, and add an animation. For students with advanced skills, challenge them to create a more complex design, such as a digital collage, using multiple images and formatting techniques.

- **Challenge Task**

  Assign a task where students create a digital collage using images they upload and format on Canva. Encourage creativity and originality. Provide examples of effective collages and discuss what makes them successful. Offer support and feedback as students work on their designs. For students who require additional support, offer one-on-one assistance and break the task down into smaller, manageable steps.

- **Wrap-Up Assessment and Exit Ticket**

  Review the students' collages and provide feedback on their use of Canva's image features. Highlight strengths and suggest areas for improvement. Ask students to write down one new feature they discovered and how they used it in their design. This helps reinforce learning and encourages students to explore Canva further.

Performance Indicators:

- Students can upload and format images on Canva with confidence.
- Students can use Canva's tools to enhance and customise images effectively.

Lesson Plan 5

Topic: Text Effects in Canva

Pages: 32-36

Core Competencies

- **Digital Literacy:** Ensuring students are comfortable using digital tools and platforms like Canva. This competency is crucial for navigating the digital world effectively and safely.
- **Technical Skills:** Developing students' ability to use specific tools and features within Canva. This competency helps students become proficient in using technology for creative purposes.
- **Creativity:** Encouraging students to think outside the box and come up with unique design ideas. This competency helps students develop their ability to generate original ideas and solutions.

Learning Outcomes

Students will be able to:

- Use text options in the object panel.
- Apply shortcut keys for customisable lines and shapes.
- Group and ungroup elements.
- Add lines, shapes, and use the asset library.
- Align elements in Canva.

Resources

- Computers or tablets with internet access
- Canva accounts for each student
- Projector and screen

Methodology

- **Introduction**

  Provide an overview of text effects in Canva. Explain the text options available in the object panel and how to use them. Use a live demonstration to show how to apply text effects. Highlight key features and explain their functions. For students with different abilities, provide visual aids and simplified explanations to ensure everyone understands the process.

- **Guided Practice**

  Walk students through the process of using shortcut keys for customisable lines and shapes. Show how to group and ungroup elements. Use analogies like comparing text effects to decorating a cake, where each element adds to the overall design. For students who need more support, provide step-by-step instructions and additional examples to reinforce understanding.

- **Interactive Exploration**

  Allow students to explore Canva's text tools on their own, trying out different text effects. Encourage them to experiment with adding lines, shapes, and using the asset library. Provide a scavenger hunt activity where students have to find and use specific text features within Canva. For example, ask them to add a text box, customise a shape, and align elements. For students with advanced skills, challenge them to create more complex designs and explore additional text features in Canva.

- **Challenge Task**

  Assign a task where students create a digital poster using text effects, incorporating at least three different features discussed. Encourage creativity and originality. Provide examples of effective posters and discuss what makes them successful. Offer support and feedback as students work on their designs. For students who need more guidance, offer one-on-one assistance and break the task into smaller, manageable steps.

- **Wrap-Up Assessment and Exit Ticket**

  Review the students' posters and provide feedback on their use of Canva's text features. Highlight strengths and suggest areas for improvement. Ask students to write down one new feature they discovered and describe how they incorporated it into their design. This helps reinforce learning and encourages students to explore Canva further. For students with different abilities, provide alternative ways to express their learning, such as drawing or verbal explanations.

  Students can now answer question 2a on page 40 and do the In the Lab activity on page 41.

Performance Indicators

Students can:

- use text options in the object panel with confidence.
- apply shortcut keys for customisable lines and shapes effectively.
- group and ungroup elements and use the asset library.

Lesson Plan 6

Topic: Saving and Organising Design Work

Pages: 37-39

Core Competencies

- **Digital Literacy:** Ensuring students are comfortable using digital tools and platforms like Canva. This competency is crucial for navigating the digital world effectively and safely.
- **Technical Skills:** Developing students' ability to use specific tools and features within Canva. This competency helps students become proficient in using technology for creative purposes.
- **Collaboration:** Teaching students to work together on design projects. This competency helps students develop teamwork and communication skills.

Learning Outcomes

Students will be able to:

- Save and organise design work by creating and saving in folders.
- Collaborate on design work in Canva and use alternative sharing options.

Resources

- Computers or tablets with internet access
- Canva accounts for each student
- Projector and screen

Methodology

- **Introduction**

  Begin by explaining the importance of saving and organising design work. Use the analogy of a 'digital design studio' where each project needs to be neatly stored and easily accessible, just like books on a bookshelf. Explain that students will learn how to create folders, save their designs, and collaborate with classmates on Canva.

- **Guided Practice**

  Walk students through the process of saving and organising their design work. Demonstrate how to create folders and save designs in them. Use analogies like comparing organising design work to organising a bookshelf, where each folder is like a shelf for different types of books. Show how to name folders and designs clearly to make them easy to find later. For students who need more support, provide step-by-step instructions and additional examples to reinforce understanding.

- **Interactive Exploration**

  Allow students to explore Canva's organisation tools on their own. Encourage them to create folders and save their designs. Provide a scavenger hunt activity where students have to find and use specific organisation features within Canva. For example, ask them to create a folder, save a design, and share it with a classmate. For students with advanced skills, challenge them to organise a complex project and explore additional organisation features in Canva.

- **Design Organisation & Sharing**

  Use the analogy of a 'digital design studio' to explain the importance of organising and sharing design work. Begin with basic saving techniques, showing students how to save their designs in folders. Challenge students to collaborate on a design project, using Canva's sharing options. Finish with a 'client presentation' simulation where students present their collaborative projects to the class.

- **Challenge Task**

  Assign a task that requires students to collaborate on a design project, utilising Canva's sharing options. Encourage teamwork and communication. Provide examples of effective collaboration and discuss the factors that contribute to its success. Offer support and feedback as students work on their projects. For students who require additional support, offer one-on-one assistance and break the task down into smaller, manageable steps.

- **Wrap-Up Assessment and Exit Ticket**

  Review the students' collaborative projects and provide feedback on their use of Canva's organisation and sharing features. Highlight strengths and suggest areas for improvement. Ask students to write down one new feature they discovered and describe how they incorporated it into their design. This helps reinforce learning and encourages students to explore Canva further. For students with different abilities, provide alternative ways to express their learning, such as drawing or verbal explanations. Students can now answer questions one and 2c on pages 40-41 and also do the group activity on page 41.

Performance Indicators

Students can:

- save and organise their design work in folders with confidence.
- collaborate on design projects and use alternative sharing options effectively.

IN THE LAB

Activity

Your school is hosting a special open day event, where students will have the opportunity to showcase their projects, participate in exciting competitions (such as debates, speeches, and singing), and enjoy a variety of food stalls and games. Design a poster for the event using Canva. Create an inviting event card.

Instructions

- Divide students into small groups.
- Ask each group to brainstorm ideas for their poster, taking into account the event details, themes, and colour schemes.
- Encourage them to discuss and decide on the layout, images, and text they will use.
- Allow students to work independently on their posters using Canva.
- Circulate the classroom to provide support and answer questions.
- Encourage students to experiment with different design elements and make their posters visually appealing.
- Ensure students log in to their Canva accounts.
- Guide students to select an appropriate poster template from the 'Poster' category.
- Ask students to:
    a. Click on the text boxes to edit event details (e.g., date, time, activities).
    b. Use the 'Elements' tab to add relevant images or icons.
    c. Adjust colours and fonts to match the event theme.
    d. Use the 'Uploads' tab to add any specific images provided by the school.
- Encourage students to review their posters for clarity and visual appeal.
- Have students exchange posters with a peer for feedback.
- Ask them to review each other's work based on criteria such as clarity, creativity, and adherence to the event details.
- Encourage constructive feedback and suggestions for improvement.

APPLICATION BASED QUESTIONS

Activity

Compare the design elements of two books from the library of your choice. Discuss the aspects such as cover art, typography, layout, and overall aesthetic appeal. Conclude by explaining which book you believe has a superior design and why.

Instructions

- Briefly explain the task: comparing the design elements of two books.
- Emphasise that this is a review exercise to assess their understanding and analytical skills.
- Allow students to choose two books from the library.
- Encourage them to select books with distinct design styles for a more meaningful comparison.
- Ask students to analyse the design elements of each book independently.
- Provide specific aspects to focus on:
  a. Cover Art: Evaluate the imagery, color scheme, and overall visual impact.
  b. Typography: Examine the font styles, sizes, and readability.
  c. Layout: Look at the arrangement of text and images, margins, and spacing.
  d. Overall Aesthetic Appeal: Consider the harmony and attractiveness of the design.
- Pair students or form small groups to discuss their findings.
- Encourage them to compare their observations and note similarities and differences.
- Ask them to discuss which book they believe has a superior design and why.
- Have each group present their analysis and conclusions to the class.
- Encourage them to explain their reasoning and highlight key points.

GROUP PROJECT

Activity

School Yearbook' Create a digital yearbook for your class or school.

- Yearbook Theme: Decide on a theme for the yearbook, such as 'Memories in Motion' or 'Our Unforgettable Journey.'
- Page Allocation: Assign each group member specific pages or sections to design. These could include class photos, memorable events, student profiles, or club activities.
- Design and Layout: Use Canva to design pages, incorporating photos, captions, and creative layouts. Ensure consistency in style and color schemes throughout the yearbook.

- Content Collection: Collect photos and stories from classmates or school events to include in the yearbook.
- Proofreading: Review and proofread all content and designs to eliminate errors.
- Digital Compilation: Compile all designed pages into a digital yearbook using Canva's tools.
- Distribution: Share the digital yearbook with classmates and teachers, or consider printing physical copies if possible.

Instructions

- Discuss possible themes for the yearbook, such as 'Memories in Motion' or 'Our Unforgettable Journey.'
- Allow students to vote on their preferred theme.
- Assign each group member specific pages or sections to design.
- Examples of sections include class photos, memorable events, student profiles, and club activities.
- Guide students to use Canva for designing their assigned pages.
    1. Login: Ensure students log in to their Canva accounts.
    2. Template Selection: Direct students to select appropriate templates for their pages.
    3. Customisation: Ask students to:
    4. Click on text boxes to add captions and descriptions.
    5. Use the 'Elements' tab to add relevant images, icons, and graphics.
    6. Adjust colours and fonts to match the chosen theme.
    7. Use the 'Uploads' tab to add photos collected from classmates or school events.
    8. Consistency: Ensure students maintain a consistent style and colour scheme throughout the yearbook.
- Collect photos and stories from classmates or school events.
- Ensure all content is organised and ready for inclusion in the yearbook.
- Review and proofread all content and designs to eliminate errors.
- Encourage students to check for spelling, grammar, and design consistency.
- Compile all designed pages into a digital yearbook using Canva's tools.
- Ensure the final product is cohesive and visually appealing. Share the digital yearbook with classmates and teachers.

Engagement Activities

Design Detective

- Students will analyse magazine/website clippings to identify and label design elements (line, shape, balance, texture, colour, negative space), understanding their impact on visual communication.

Digital Storyboard

- Students will create a simple storyboard using design fundamentals, demonstrating practical application of learned concepts in storytelling.

Canva Treasure Hunt

- Students will locate and label Canva interface elements (search bar, templates, 'Create a design' button, panels), familiarising themselves with the platform's layout.

Template Match

- Students will match design project descriptions to appropriate Canva templates, understanding the purpose and use of templates.

Canva Design Challenge

- Students will design a digital poster using the Canva editor, applying the skills they have learned by adjusting elements, text, and background.

Editor Scavenger Hunt

- Students will explore and demonstrate the use of Canva editor features (workspace, object panel, uploads, draw, add page), enhancing their navigation skills.

Image Transformation

- Students will manipulate uploaded images in Canva, experimenting with cropping, transparency, and animation to understand image formatting.

Canva Photo Collage

- Students create a photo collage, practicing image placement and formatting techniques.

Riddles

1. I guide your eyes, I can be straight or curved, I can divide or connect. What am I?
   Answer: Line
2. I fill space, I can be round or square, I can be a button or a bear. What am I?
   Answer: Shape/Form
3. I'm the silent partner, the empty space, I give your eyes a comfortable place. What am I?
   Answer: Negative Space

4. I can be warm or cool, bright or dark, I can make you feel happy or leave a mark. What am I?
   Answer: Colour
5. I hold many styles for every need, from posters to slides; I help you succeed. What am I?
   Answer: Templates
6. I help you find what you want to see, pictures, or text; search for me. What am I?
   Answer: Search bar
7. I am where you go to start something new; I'm waiting for you for any design. What am I?
   Answer: Create a design button
8. I hold the tools that help you create on the sides of your screen; I help you not wait. What am I?
   Answer: Panels
9. I help your designs stay in a row, making them neat, wherever they go.
   Answer: Align
10. I keep your designs tidy in digital drawers, where projects come together.
    Answer: Folders

Application-Based Scenario

1. Imagine you're creating a digital invitation for your class party. Explain how you would use colour and negative space to make it look inviting and easy to read.
2. Why is it important to have a search bar in canva? What are some things you would search for?
3. Explain the steps you would take to change the background of a Canva design and add a title to it.
4. Why is it important to organise your digital design files? What are some ways canva helps you to do this?
5. Describe how to group multiple shapes together in Canva and explain why this is useful.

Answer for Exercise

1. Choose the correct answer:

a. Graphic design
b. Form
c. The equal distribution of weight in a design
d. It has a user-friendly drag-and-drop interface
e. Use the Share feature and send a link or email invitation

2. Answer the questions:

a. The object panel in Canva features tools that allow you to adjust the appearance of elements. For example, you can change the colour of a shape, make text bigger or smaller, change the font, add effects like shadows to text, or adjust the transparency of an image.

b. Negative space is the empty space around pictures and words in a design. It's like the air around a balloon. It's important because it makes the design look clean and easy to read. If there's too much stuff crowded together, it's hard to see anything. Negative space gives your eyes a break.

c. To work together on Canva, you can use the Share button. Here's how:
   1. Click the Share button on the top right.
   2. Type in the email address of your friend or classmate.
   3. Choose if they can view or edit the design.
   4. Click Send.
   5. Now, you and your friend can both work on the design at the same time.

d. To make a birthday e-card in Canva:
   1. Go to the Canva website or app.
   2. Click the 'Create a design' button.
   3. Search for 'birthday e-card' or choose a template that looks good.
   4. Pick a template you like or start with a blank page.
   5. Add pictures, text, and colours to make it look fun!
   6. Once it looks good, share it by downloading it or sharing it through the sharing option.

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CHAPTER 4

FUNDAMENTALS OF DESIGN THINKING

Learning Outcomes

Students will be able to

1. Understand and apply the basic steps of the Design Thinking process to find creative solutions to simple problems.
2. Learn from testing and make their ideas better.
3. Use mind maps to organise their ideas and break down problems into smaller parts.

Lesson Plan 1

Topic: Design Thinking

Pages: 42-44

Core Competencies

- **Critical Thinking:** Students will analyse problems and evaluate solutions systematically. They will learn to question assumptions and consider multiple perspectives.
- **Creativity:** Students will develop the ability to think outside the box and generate innovative ideas. They will learn to use their imagination to create unique solutions.
- **Problem-Solving:** Students will learn to identify problems, brainstorm solutions, and implement effective strategies. They will develop resilience and adaptability in facing challenges.
- **Collaboration:** Students will work together in teams, sharing ideas and building on each other's strengths. They will learn the importance of communication and teamwork in achieving common goals.

Learning Outcomes

Students will be able to:

- understand the definition and uses of design thinking.
- learn and apply the five steps of the design thinking process: empathise, define, ideate, prototype, and test.
- develop skills in empathy, ideation, prototyping, and iterative improvement.

Resources

- Chart paper and markers
- Sticky notes
- Prototyping materials (e.g., paper, cardboard, scissors, glue)
- Digital tools (optional)

Methodology

- **Background Information**

  Design thinking is a human-centered approach to innovation that involves understanding users, redefining problems, and creating innovative solutions. It is widely used in various industries to tackle complex problems and develop user-friendly products and services.

- **Introduction**

  Begin with a story or analogy to explain design thinking. For example, compare it to a detective solving a mystery by understanding clues (empathising), defining the problem, brainstorming solutions, testing ideas, and refining them. Explain the importance of design thinking in everyday life and various professions. Share examples like designing a new app, improving a classroom layout, or creating a community garden. Ask students to read pages 42-44 and then engage them in activities.

- **Guided Practice**

  Step 1: Empathise

- Conduct a mock interview with a student playing the role of a user (e.g., a student needing a better backpack). Ask questions to understand their needs and challenges.
- Create an empathy map on chart paper, highlighting the user's feelings, needs, and pain points.
- The teacher can ask: 'What do you think our user needs the most in a school backpack?'
- Sample Student Response: 'I think the user needs more pockets to organise their things.'
- The teacher can ask this follow-up question: 'That's a great observation! Why do you think having more pockets would help our user? Can you think of any specific items they might want to organise?'

  Step 2: Define

- Have students work in groups to summarise the main problem based on the empathy map. Encourage them to write a clear problem statement.
- Share and compare problem statements, discussing how well they capture the user's needs.
- **The teacher can ask:** 'Based on what we learned, how would you describe the main problem our user is facing?'
- Sample Student Response: 'The main problem is that the backpack is too heavy and uncomfortable to carry.'
- The teacher can ask this follow-up question: 'Excellent! Let's write that down as our problem statement. Now, can we think about what features would make the backpack lighter and more comfortable?'

  Step 3: Ideate

- Facilitate a brainstorming session where students generate as many ideas as possible. Use techniques like SCAMPER (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Reverse).
- Review the ideas and select the most promising ones. Encourage students to explain why they think their ideas will solve the problem.
- **The teacher can ask:** 'Let's brainstorm as many ideas as we can. Remember, no idea is too crazy at this stage! What are some ways we can make the backpack better?'
- **Sample Student Response:** 'We could use lighter materials, add padded straps, and maybe even include a built-in water bottle holder.'
- The teacher can ask this follow-up question: 'Fantastic ideas! Let's list them all. Can anyone think of other features that might help? How about something that makes the backpack more fun or stylish?'

- **Interactive Exploration**

  Step 4: Prototype

- Provide prototyping materials and guide students to create simple models of their solutions. Encourage creativity and resourcefulness.
- **The teacher can ask:** 'How can we quickly create a model of our idea? What materials will we need?'
- **Sample Student Response:** 'We can use cardboard to make the shape of the backpack and paper for the pockets.'

The teacher can ask this follow-up question: 'Great plan! Let's gather our materials and start building. Remember, this is just a model, so it's okay if it's not perfect. We can always make changes later.'

Step 5: Test

Organise a testing session where students try out each other's prototypes and provide feedback. Use a feedback form to structure responses.

The teacher can ask: Let's see how our prototype works. What feedback did we get, and how can we improve it?'

Sample Student Response: 'Our tester said the straps are still a bit uncomfortable and the pockets are hard to reach.'

The teacher can ask this follow-up question: 'Good feedback! How can we adjust the straps to make them more comfortable? And what can we do to make the pockets easier to access? Let's brainstorm some solutions and update our prototype.'

- **Challenge Task**

  Assign a real-world problem (e.g., designing an eco-friendlier lunchbox) and have students apply the design thinking process from start to finish. Provide guidance and support as needed. Reflect on the process and outcomes. Discuss what worked well and what could be improved.

- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their final prototypes and explain how they followed the design thinking process. Students can now answer questions 2a and b and do the In the lab activity on page 48.

Performance Indicators

Students can:

- explain the five steps of the design thinking process.
- demonstrate empathy by accurately identifying user needs.
- generate multiple ideas and select the most feasible ones.
- create and test prototypes, showing iterative improvement based on feedback.

Lesson Plan 2

Topic: Apply design thinking

Pages:44-45

Core Competencies

1. **Critical Thinking:** Students will analyse real-life problems and evaluate solutions systematically. They will learn to question assumptions and consider multiple perspectives.
2. **Creativity:** Students will develop the ability to think outside the box and generate innovative ideas. They will use their imagination to create unique solutions to everyday problems.
3. **Problem-Solving:** Students will learn to identify problems, brainstorm solutions, and implement effective strategies. They will develop resilience and adaptability in facing challenges.
4. **Collaboration:** Students will work together in teams, sharing ideas and building on each other's strengths. They will learn the importance of communication and teamwork in achieving common goals.

Learning Outcomes

- Students will understand how to apply the design thinking process to real-life situations.
- Students will learn from case studies and examples of design thinking in action.
- Students will develop skills in empathy, ideation, prototyping, and iterative improvement.

Resources

- Chart paper and markers
- Sticky notes
- Prototyping materials (e.g., paper, cardboard, scissors, glue)
- Case study materials (printed or digital)
- Digital tools (optional)

Methodology

- **Introduction**

  Begin with a brief recap of the design thinking process. Use an engaging analogy, such as comparing design thinking to a superhero solving problems with creativity and empathy. Explain that today's lesson will focus on applying design thinking to real-life examples and case studies.
- **Guided Practice**

  Step 1: Empathise
- Present a case study (e.g., redesigning a public park to be more accessible). Discuss the users involved (e.g., children, elderly, people with disabilities).
- **Sample Question:** 'What do you think our users need the most in a public park?'
- **Student Response:** 'I think they need more benches and shaded areas.'
- **Teacher Follow-Up:** 'That's a great observation! Why do you think having more benches and shaded areas would help our users? Can you think of any specific needs for different user groups?'

  Step 2: Define
- **Activity:** Have students work in groups to summarise the main problem based on the empathy map. Encourage them to write a clear problem statement.
- **Sample Question:** 'Based on what we learned, how would you describe the main problem our users are facing?'
- **Student Response:** 'The main problem is that there aren't enough places to rest and stay cool.'
- **Teacher Follow-Up:** 'Excellent! Let's write that down as our problem statement. Now, can we think about what features would make the park more comfortable for everyone?'

  Step 3: Ideate
- **Activity:** Facilitate a brainstorming session where students generate as many ideas as possible. Use techniques like SCAMPER (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Reverse).
- **Sample Question:** 'Let's brainstorm as many ideas as we can. Remember, no idea is too crazy at this stage! What are some ways we can make the park better?'

- **Student Response:** 'We could add more trees, build a playground, and create walking paths.'
- **Teacher Follow-Up:** 'Fantastic ideas! Let's list them all. Can anyone think of other features that might help? How about something that makes the park more fun or accessible?'
- **Interactive Exploration**

  Step 4: Prototype
- **Activity:** Provide prototyping materials and guide students to create simple models of their solutions. Encourage creativity and resourcefulness.
- **Sample Question:** 'How can we quickly create a model of our idea? What materials will we need?'
- **Student Response:** 'We can use cardboard to make the benches and paper for the trees.'
- **Teacher Follow-Up:** 'Great plan! Let's gather our materials and start building. Remember, this is just a model, so it's okay if it's not perfect. We can always make changes later.'

  Step 5: Test
- **Activity:** Organise a testing session where students try out each other's prototypes and provide feedback. Use a feedback form to structure responses.
- **Sample Question:** 'Let's see how our prototype works. What feedback did we get, and how can we improve it?'
- **Student Response:** 'Our tester said the benches are too far apart and the playground needs more shade.'
- **Teacher Follow-Up:** 'Good feedback! How can we adjust the benches to make them more accessible? And what can we do to provide more shade for the playground? Let's brainstorm some solutions and update our prototype.'
- **Challenge Task**
- Assign a real-world problem (e.g., designing a more eco-friendly lunchbox) and have students apply the design thinking process from start to finish. Provide guidance and support as needed.
- **Sample Question:** 'What are some features that would make a lunchbox more eco-friendly?'
- **Student Response:** 'We could use recyclable materials and include compartments for different foods.'
- **Teacher Follow-Up:** 'Great ideas! Let's think about how we can design this lunchbox. What materials will we need for our prototype?'
- **Wrap-Up Assessment and Exit Ticket**
- Have each group present their final prototypes and explain how they followed the design thinking process. Ask students to write one thing they learned and one question they still have about design thinking. Now students can answer questions 2d and e and do the Application-based questions activities on page 48.

Performance Indicators

Students can:

- explain the five steps of the design thinking process.
- demonstrate empathy by accurately identifying user needs.
- generate multiple ideas and select the most feasible ones.
- create and test prototypes, showing iterative improvement based on feedback.

Lesson Plan 3

Topic: Exploring Mind Maps; Creating Mind Maps in Canva

Pages: 45-47

Core Competencies

- **Critical Thinking:** Students will analyse information and identify key concepts. They will learn to organise thoughts systematically and make connections between ideas.
- **Creativity:** Students will develop the ability to represent information in innovative ways visually. They will use their imagination to create unique and engaging mind maps.
- **Problem-Solving:** Students will learn to break down complex problems into manageable parts and find solutions. They will develop resilience and adaptability in facing challenges.
- **Collaboration:** Students will work together in teams, sharing ideas and building on each other's strengths. They will learn the importance of communication and teamwork in achieving common goals.

Learning Outcomes

Students will be able to:

- understand the concept of mind maps and their uses.
- learn to identify central themes, associations, and keywords.
- develop skills in creating mind maps using Canva.

Resources

- Chart paper and markers
- Sticky notes
- Computers or tablets with internet access
- Canva account (free version)

Methodology

- **Background Information**

  Mind maps are visual representations of information that help organise thoughts and ideas. They are used to brainstorm, plan projects, and solve problems by making connections between concepts. Canva is a user-friendly digital tool that allows students to create visually appealing mind maps.

- **Introduction**

  Begin with a brief explanation of mind maps and their importance in organising information. Use an engaging analogy, such as comparing mind maps to a tree with branches representing different ideas. Explain that today's lesson will focus on creating mind maps and using Canva to visualise information.

- **Guided Practice**

  Central Theme

  Introduce the concept of a central theme by presenting a topic (e.g., 'Healthy Eating') and discussing its main idea. Explain that the central theme is the core around which the mind map is built. For example, you can ask students, 'What do you think is the central theme of our topic 'Healthy Eating'?' Students may respond: 'The central theme is eating foods that are good for our health.' The teacher can follow up with: 'Exactly! Let's write 'Healthy Eating' in the center of our mind map. Now, let's think about what branches we can add to this theme.'

- **Associations**

  Discuss associations related to the central theme. Explain that associations are the connections between the central theme and related ideas. For example, you can ask students, 'What are some associations we can make with 'Healthy Eating'?' Students may respond: 'Fruits, vegetables, exercise, drinking water.' The teacher can follow up with: 'Great! Let's add these associations as branches on our mind map. Can anyone think of other related ideas?'

- **Keywords**

  Identify keywords for each association. Explain that keywords are important concepts that help us understand the associations. For example, you can ask students, 'What keywords can we use for the association 'Fruits'?' Students may respond: 'Apples, bananas, vitamins.' The teacher can follow up with: 'Perfect! Let's add these keywords to our mind map. How about keywords for 'Vegetables'?'

- **Interactive Exploration**

  Guide students to create their own mind maps using Canva. Provide a step-by-step tutorial on how to use Canva's tools to add central themes, associations, and keywords. For example, you can ask, 'How can we start creating our mind map in Canva? What should we add first?' Students may respond: 'We should start by adding the central theme in the middle.' The teacher can follow up with: 'Exactly! Let's add 'Healthy Eating' in the center. Now, let's add branches for our associations.'

- **Challenge Task**

  Assign a real-world topic (e.g., 'Environmental Conservation') and have students create mind maps using Canva. Provide guidance and support as needed. For example, you can ask, 'What is the central theme for 'Environmental Conservation'?' Students may respond: 'Protecting the environment.' The teacher can follow up with: 'Great! Let's add that to the center of our mind map. What associations can we draw from this theme?

- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their mind maps and explain how they identified the central theme, associated ideas, and key words. Use an exit ticket where students write one thing they learned and one question they still have about mind maps. By the end of this lesson, students can answer question 1 on page 47, 2c and Group Project on page 48.

Performance Indicators

- Students can explain the concept of mind maps and their uses.
- Students identify central themes, associations, and keywords accurately.
- Students create mind maps using Canva, demonstrating their understanding of the process.

IN THE LAB

Activity 1

Create a simple mind map illustrating the elements of your favourite hobby.

Instructions

- Explain the activity's goal: to create a mind map illustrating the elements of their favourite hobby.
- Discuss the importance of mind mapping as a tool for organising thoughts and ideas.
- Have students think about their favourite hobby and list the main elements or aspects of it. For example, if their hobby is playing soccer, elements might include equipment, rules, famous players, and training.
- Encourage students to share their ideas with a partner or small group to get additional input and inspiration.
- Provide paper and coloured pencils or markers for students to create their mind maps.
- Show examples of mind maps and provide step-by-step guides to help students understand how to structure their mind maps.
- If available, allow students to use computers or tablets to create digital mind maps using tools like MindMeister or Google Drawings.
- Walk around the classroom to assist students with any questions and provide guidance as needed.
- Have students share their mind maps with the class or in small groups.
- Encourage students to explain the elements they included and why they are important to their hobby.
- Use open-ended questions to stimulate discussion and critical thinking:
- 'What do you enjoy most about your hobby?'
- 'How did you decide which elements to include in your mind map?'
- 'What new ideas did you get from your classmates' mind maps?'

Activity 2

Identify a problem in your school or community and outline the steps you would take in the Design Thinking process to address it.

Instructions

- Explain the activity's goal: to identify a problem in their school or community and outline the steps they would take in the Design Thinking process to address it.
- Discuss the importance of Design Thinking as a problem-solving approach that encourages creativity and innovation.

- Have students think about problems they have noticed in their school or community. Examples might include littering, lack of playground equipment, or bullying.
- Encourage students to share their ideas with a partner or small group to get additional input and inspiration.
- Guide students to empathise with those affected by the problem. Ask them to consider questions like:
  - 'Who is affected by this problem?'
  - 'How does this problem impact their daily lives?'
  - 'What are their needs and concerns?'
- Provide paper and pencils for students to take notes and write down their observations.
- Help students define the problem clearly. Encourage them to write a problem statement that summarises the issue and its impact.
- Use visual aids and examples to illustrate how to create a clear and concise problem statement.
- Have students brainstorm possible solutions to the problem. Encourage them to think creatively and consider different approaches.
- Provide markers and pens for students to sketch their ideas and write down their solutions.
- Monitor progress and offer assistance as needed to ensure all students are participating and contributing.
- Guide students to create a simple prototype of their chosen solution. This could be a drawing, a model, or a digital representation.
- Provide materials such as paper, cardboard, markers, and digital tools for students to create their prototypes.
- Encourage students to test their prototypes and gather feedback from their peers.
- Have students present their prototypes to the class and explain how they address the problem.
- Use Socratic questioning to guide the discussion and deepen understanding:
  - 'How does your prototype solve the problem?'
  - 'What feedback did you receive from your peers?'
  - 'What changes would you make to improve your prototype?'
- Encourage students to think critically about their solutions and consider ways to refine them.

GROUP PROJECT

Activity

How can you design a simple budget plan for a family picnic? Consider the costs of food, transportation, and activities. Work together to allocate a fixed amount of money and present your plan with creative ideas to save and spend wisely.

Instructions

- Explain the activity's goal: to design a simple budget plan for a family picnic, considering the costs of food, transportation, and activities.
- Discuss the importance of budgeting and managing money wisely.
- Divide students into small groups (3-4 students per group). Ask each group to brainstorm the different costs they need to consider for a family picnic. Encourage them to think about:
  a. Food (e.g., snacks, drinks, meals)
  b. Transportation (e.g., fuel, public transport, parking)
  c. Activities (e.g., games, entrance fees, equipment)
- Have each group write down their ideas and be prepared to share them with the class.
- Assign a fixed amount of money for the picnic budget (e.g., PKR 1000-5000).
- Discuss how to allocate the budget across different categories (food, transportation, activities).
- Guide students to create a simple budget plan using the fixed amount of money.
- Calculations: Provide calculators for students to calculate the costs and ensure they stay within the budget.
- Visual Learning: Show examples of budget plans and provide step-by-step guides to help students structure their plans.
- Digital Option: If available, allow students to use computers or tablets to create digital budget plans using tools like Google Sheets or Excel.
- Encourage students to think of creative ideas to save money and spend wisely. Examples might include:
  a. Bringing homemade food instead of buying pre-packaged snacks
  b. Carpooling to save on transportation costs
  c. Choosing free or low-cost activities
- Have each group incorporate these ideas into their budget plan.
- Have students prepare to present their budget plans to the class.
- Encourage them to explain their choices and how they managed to stay within the budget.
- Use open-ended questions to stimulate discussion and critical thinking:
  a. 'How did you decide how much to allocate for each category?'
  b. 'What creative ideas did you come up with to save money?'
  c. 'What challenges did you face while creating the budget plan?'

- Have each group present their budget plans to the class.
- Encourage students to ask questions and provide feedback on each other's plans.
- Use Socratic questioning to guide the discussion and deepen understanding:
  a. 'Why did you choose to allocate more money to one category over another?'
  b. 'How do you think your budget plan will ensure a fun and affordable picnic?'
  c. 'What changes would you make if you had a larger or smaller budget?'
- Summarise the key points discussed during the activity:
  a. The importance of budgeting and managing money wisely
  b. How to allocate a fixed amount of money across different categories
  c. Creative ideas for saving and spending wisely

APPLICATION BASED QUESTIONS

Activity 1

Imagine you are tasked with organising a school event, and many ideas are floating around. How would you use a mind map to organise and prioritise these ideas?

Instructions

- Explain the activity's goal: to use a mind map to organise and prioritise ideas for organising a school event.
- Discuss the importance of organising and prioritising ideas to ensure a successful event.
- Have students consider various aspects of organising a school event. Examples might include venue, decorations, food, activities, and invitations.
- Encourage students to share their ideas with a partner or small group to get additional input and inspiration.
- Provide paper and coloured pencils or markers for students to create their mind maps.
- Provide examples of mind maps and offer step-by-step guides to help students understand how to effectively structure their mind maps.
- If available, allow students to use computers or tablets to create digital mind maps using tools like MindMeister or Google Drawings.
- Guide students to organise their ideas into categories on their mind maps. For example, they might have branches for venue, decorations, food, activities, and invitations.
- Encourage students to add sub-branches with specific details for each category, such as types of decorations or potential activities.
- Have students prioritise their ideas by highlighting or marking the most important ones. Discuss criteria for prioritising, such as feasibility, cost, and impact on the event.

- Encourage students to think about which ideas are essential for the event's success and which ones are nice-to-have but not critical.
- Have students share their mind maps with the class or in small groups.
- Encourage students to explain how they organised and prioritised their ideas.
- Use open-ended questions to stimulate discussion and critical thinking:
  a. 'What criteria did you use to prioritise your ideas?'
  b. 'How did you decide which ideas were most important?'
  c. 'What challenges did you face while organising and prioritising your ideas?'
- Summarise the key points discussed during the activity:
  a. The importance of organising and prioritising ideas for a successful event
  b. How mind maps can help visualise and structure different aspects of a project

Activity 2

As a student, you face the challenge of managing both schoolwork and extracurricular activities. How can the principles of Design Thinking help you find a balanced solution?

Instructions

- Explain the activity's goal: to use the principles of Design Thinking to find a balanced solution for managing schoolwork and extracurricular activities.
- Discuss the importance of balancing various responsibilities and how Design Thinking can aid in finding innovative solutions.
- Have students think about their own experiences with managing schoolwork and extracurricular activities. Encourage them to share their challenges and feelings with a partner or small group.
- Ask students to consider questions like:
  a. 'What are the main challenges you face in balancing schoolwork and extracurricular activities?'
  b. 'How do these challenges affect your daily life and well-being?'
- Provide paper and pencils for students to take notes and write down their observations.
- Help students define the problem clearly. Encourage them to write a problem statement that summarises the issue and its impact.
- Use visual aids and examples to illustrate how to create a clear and concise problem statement.
- Have students brainstorm possible solutions to the problem. Encourage them to think creatively and consider different approaches.
- Provide markers and pens for students to sketch their ideas and write down their solutions.
- If available, allow students to use computers or tablets to research time management techniques and tools.

- Guide students to create a simple prototype of their chosen solution. This could be a weekly schedule, a to-do list, or a digital calendar.
- Provide materials such as paper, markers, and digital tools for students to create their prototypes.
- Encourage students to test their prototypes and gather feedback from their peers.
- Have students present their prototypes to the class and explain how they address the problem.
- Use Socratic questioning to guide the discussion and deepen understanding:
  a. 'How does your prototype help you balance schoolwork and extracurricular activities?'
  b. 'What feedback did you receive from your peers?'
  c. 'What changes would you make to improve your prototype?'
- Encourage students to think critically about their solutions and consider ways to refine them.
- Summarise the key points discussed during the activity:
  a. The steps of the Design Thinking process (Empathise, Define, Ideate, Prototype, Test)
  b. The importance of balancing schoolwork and extracurricular activities
  c. How creative problem-solving can help manage different responsibilities

Engagement Activities

Design a Better Backpack

- Students often face problems with their backpacks being too heavy, things getting lost, and becoming uncomfortable. Introduce Design Thinking as a method for solving problems by thinking like designers. Discuss how we can improve a backpack by following the five steps.

Empathy Interview

- Students can pair up and interview each other about a problem they face, e.g., sharing toys or doing chores. Focus on understanding feelings and needs.

Crazy 8s Ideation

- Students fold a paper into eight sections and draw eight different solutions to a problem in a short time. Encourage wild and silly ideas.

Test Your Prototype Feedback

- Students can present their prototypes and receive feedback from their classmates. Discuss what worked well and what could be improved.

Iterate and Improve

- Students can use the feedback to make changes to their prototypes. Discuss how design is an ongoing process of improvement.

Design Thinking in Daily Life Case Studies

- Discuss examples of design thinking in everyday life. For example, the design of easy-to-open food packaging, or the design of a playground.

Central Theme Brainstorm

- Choose a fun topic, e.g., My Favourite Animal, Summer Vacation. Students can brainstorm words and ideas related to the central theme.

Create a Mind Map on Paper

- Students can create mind maps on paper, using the central theme and its associated ideas. Focus on using keywords and drawing connections.

Mind Maps in Canva Introduction

- Introduce Canva as a tool for creating digital mind maps. Students can create simple mind maps using Canva templates.

Riddles

1. I help you solve problems by thinking like a designer. I have five steps to make things finer.
   Answer: Design Thinking
2. I'm the first step, where you feel for others, understanding their needs, like sisters and brothers.
   Answer: Empathise
3. I'm the place where ideas flow, wild and creative, watch them grow.
   Answer: Ideate
4. I'm a model of your idea, made with hands or tools, to see if it works, breaking all the rules.
   Answer: Prototype
5. I'm a web of words, with a central theme that connects ideas and fuels a creative dream.
   Answer: Mind Map

Application-Based Scenarios

1. Your classroom is always messy. How would you use Design Thinking to make it more organised?
2. Your friend is sad because they don't know how to play a new game. How would you use Design Thinking to help them?
3. You want to plan a surprise party for your teacher. Create a mind map to organise your ideas.
4. The school cafeteria serves food that no one likes. How would you apply the Design Thinking process to improve the food?

Answer for Exercise

1. Choose the correct answer:

a. Identify the problem

b. It involves repeating stages until an effective solution is found.

c. They help visualise and organise thoughts.

2. Answer the following questions.

a. The answers may vary because the students should be encouraged to write in their own words and give examples. It can include the following points: Empathy is about putting yourself in someone else's shoes. It's important because we want to make things that help people. If we don't understand how they feel, we might make something that doesn't help them. It's like this: if we want to build a playground, we need to know what games kids like, not just what adults like.

b. Iterating means trying things repeatedly and making them better each time. It's like when you're drawing; you might erase and redraw a line to make it perfect. In Design Thinking, we test our ideas, see what works, and then refine them step by step.

c. The answers may vary because the students should be encouraged to write in their own words and give examples. Here is a sample: To plan a 'Super Fun School Fair.' The central theme, in the middle of our paper, is 'School Fair.' Then, we draw lines out from it to write down all the things we need, like 'Games,' 'Food,' 'Prizes,' 'Music,' and 'Decorations.' Under 'Games,' we might write 'Ring Toss,' 'Beanbag Throw,' and 'Face Painting.' It's like a spider web of ideas, all connected to the main topic, 'School Fair.'

d. The answers may vary because the students should be encouraged to write in their own words and give examples. Here is a sample for a personal challenge: Forgetting to bring homework to school:

- Identify the problem: 'I forget because I leave it in different places, and I don't have a good system.'
- Generate ideas: 'We could put my homework in my backpack right when I finish it, make a Homework Checklist to tape to my door, ask my parents to remind me, or have a special Homework Folder that always stays in my backpack.'
- Develop prototypes: 'Let's try the Homework Checklist and the Homework Folder for one week.'
- Test: 'We'll see if I remember my homework each day.'
- Iterate: 'If I still forget sometimes, we'll add reminders on my phone or try another idea from our list.' This shows how we can solve problems by thinking step by step.

CHAPTER 5

CLOUD COMPUTING

Learning Outcomes

Students will be able to:

- understand the definition of cloud computing.
- identify the advantages and disadvantages of cloud computing.
- recognise examples of cloud computing in daily life.
- learn to use the Google Drive interface.

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Lesson Plan 1

Topic: What is cloud computing; Advantages of cloud computing; Google Drive interface

Pages: 49-51

Core Competencies

1. **Critical Thinking:** Students will analyse the advantages and disadvantages of cloud computing. They will learn to assess the impact of technology on their daily lives.
2. **Digital Literacy:** Students will develop an understanding of cloud computing concepts and learn how to utilise cloud-based tools, such as Google Drive.
3. **Problem-Solving:** Students will learn to identify and address potential issues related to cloud computing. They will develop strategies for using cloud services effectively.
4. **Collaboration:** Students will work together in teams, sharing ideas and building on each other's strengths. They will learn the importance of communication and teamwork in using cloud-based tools.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- Google Drive accounts (free version)
- Chart paper and markers

Methodology

- **Background Information**

  Cloud computing involves delivering computing services (such as storage, processing, and software) over the internet. It allows users to access and manage data and applications from anywhere with an internet connection. Google Drive is a popular cloud storage service that enables users to store, share, and collaborate on files.

- **Introduction**

  Begin with a brief explanation of cloud computing. Use an engaging analogy, such as comparing cloud computing to a library where books (data) are stored and can be accessed from anywhere. Explain that today's lesson will focus on understanding cloud computing, its advantages and disadvantages, and how to use Google Drive.

- **Guided Practice**

  Introduce the concept of cloud computing by explaining that it involves storing and accessing data and programs over the internet instead of on a local computer. For example, you can ask students, 'What do you think cloud computing means?' Students may respond: 'It means using the internet to store and access files.' The teacher can follow up with: 'Exactly! Cloud computing allows us to use the internet to store and access data from anywhere.'

- **Advantages of Cloud Computing**

  Discuss the advantages of cloud computing, such as accessibility, scalability, cost-effectiveness, and reliability. For example, you can ask students, 'What are some advantages of using cloud computing?' Students may respond: 'We can access our files from anywhere, and it's more cost-effective than purchasing a large amount of storage.' The teacher can follow up with: 'Great points! Cloud computing also enables us to easily scale our storage needs up or down and provides reliable access to our data.
- **Disadvantages of Cloud Computing**

  Discuss the disadvantages of cloud computing, such as security concerns, internet dependency, and potential downtime. For example, you can ask students, 'What are some disadvantages of using cloud computing?' Students may respond: 'Our data could be hacked, and we need the internet to access our files.' The teacher can follow up with: 'Exactly! Security is a concern, and we need a reliable internet connection to access our data. There can also be times when the service is down.'
- **Interactive Exploration**

  Provide examples of cloud computing, such as storage (Google Drive), email (Gmail), and software (Google Docs). For example, you can ask, 'Can you think of any examples of cloud computing that we use every day?' Students may respond: 'We use Google Drive to store files and Gmail for email.' The teacher can follow up with: 'Exactly! These are all examples of cloud computing services that help us store, access, and share information.'
- **Google Drive Interface**

  Guide students to explore the Google Drive interface. Provide a step-by-step tutorial on how to upload files, create folders, and share documents. For example, you can ask, 'How can we upload a file to Google Drive?' Students may respond: 'We can click the 'New' button and select 'File upload'.' The teacher can follow up with: 'Exactly! Let's try uploading a file together. Now, let's create a folder to organise our files.'
- **Challenge Task**

  Assign a task where students use Google Drive to collaborate on a project. For example, you can ask, 'Let's create a shared folder for our class project. How can we share this folder with our classmates?' Students may respond: 'We can click the 'Share' button and enter our classmates' email addresses.' The teacher can follow up with: 'Great! Let's share the folder and start working on our project together.'
- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their project and explain how they used Google Drive to collaborate. Use an exit ticket where students write one thing they learned and one question they still have about cloud computing. Students can answer question 2a on page 58.

Performance Indicators

Students can:

- explain the definition of cloud computing.
- identify the advantages and disadvantages of cloud computing.
- recognise examples of cloud computing in daily life.
- demonstrate the ability to use the Google Drive interface.

Lesson Plan 2

Topic: Uploading and sorting files on Google Drive

Pages: 52-54

Core Competencies

1. **Digital Literacy:** Students will develop skills in managing files and folders using Google Drive. They will learn to upload, search, sort, and apply filters effectively.
2. **Organisational Skills:** Students will learn to organise digital information systematically. They will develop strategies for keeping their files and folders well-structured.
3. **Problem-Solving:** Students will learn to identify and address potential issues related to file management. They will develop strategies for using Google Drive efficiently.
4. **Collaboration:** Students will work together in teams, sharing ideas and building on each other's strengths. They will learn the importance of communication and teamwork in managing shared files and folders.

Learning Outcomes

Students will be able to:

- upload files and folders to Google Drive.
- search and sort files and folders.
- apply filters to organise and find information efficiently.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- Google Drive accounts (free version)
- Chart paper and markers

Methodology

- **Background Information**

  Managing files and folders in Google Drive involves uploading, searching, sorting, and applying filters to keep digital information organised. Google Drive provides tools to help users store, access, and share files from anywhere with an internet connection.

- **Introduction**

  Begin with a brief explanation of the importance of managing digital files and folders. Use an engaging analogy, such as comparing file management to organising a bookshelf where each book (file) has its place. Explain that today's lesson will focus on uploading, searching, sorting, and applying filters in Google Drive.

Guided Practice

- **Uploading Files and Folders**

  Introduce the concept of uploading files and folders to Google Drive. Explain that uploading allows us to store our documents and media in the cloud. For example, you can ask students, 'How can we upload a file to Google Drive?' Students may respond: 'We can click the 'New' button and select 'File upload'.' The teacher can follow up with: 'Exactly! Let's try uploading a file together. Now, let's upload a folder to see how it works.'

- **Searching Files and Folders**

  Discuss the importance of searching for files and folders in Google Drive. Explain that searching helps us quickly find the information we need. For example, you can ask students, 'How can we search for a file in Google Drive?' Students may respond: 'We can use the search bar at the top.' The teacher can follow up with: 'Great! Let's try searching for a file by typing its name in the search bar.'

- **Sorting Files and Folders**

  Explain the concept of sorting files and folders to keep them organised. Discuss different sorting options, such as by name, date, or size. For example, you can ask students, 'How can we sort our files in Google Drive?' Students may respond: 'We can click on the column headers to sort by name, date, or size.' The teacher can follow up with: 'Exactly! Let's try sorting our files by date to see the most recent ones first.'

- **Interactive Exploration**

  Guide students to apply filters in Google Drive to narrow down search results. Explain that filters help us find specific types of files or folders. For example, you can ask, 'How can we apply filters to our search in Google Drive?' Students may respond: 'We can click on the filter icon and select the type of file we want to find.' The teacher can follow up with: 'Exactly! Let's try applying a filter to find only documents.'

- **Challenge Task**

  Assign a task where students use Google Drive to organise a set of files and folders. For example, you can ask, 'Let's create a shared folder for our class project and organise our files. How can we sort and apply filters to keep everything organised?' Students may respond: 'We can sort the files by date and apply filters to find specific documents.' The teacher can follow up with: 'Great! Let's sort our files and apply filters to make it easier to find what we need.'

- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their organised files and folders and explain how they used sorting and filters. Use an exit ticket where students write one thing they learned and one question they still have about managing files in Google Drive. Now, the students can complete the first activity from the application-based questions and answer question 2d on page 58.

Performance Indicators

Students can:

- upload files and folders to Google Drive.
- understand how to search and sort files and folders.
- demonstrate the ability to apply filters to organise and find information efficiently.

Lesson Plan 3

Topic: Collaborating online with Zoom

Pages: 54-55

Core Competencies

1. **Digital Literacy:** Students will develop skills in using Zoom for virtual collaboration. They will learn to join meetings and participate effectively.
2. **Communication Skills:** Students will learn to communicate clearly and respectfully in a virtual environment. They will develop strategies for effective online interaction.
3. **Problem-Solving:** Students will learn to troubleshoot common issues related to joining Zoom meetings. They will develop resilience and adaptability in facing technical challenges.
4. **Collaboration:** Students will work together in virtual teams, sharing ideas and building on each other's strengths. They will learn the importance of communication and teamwork in a digital setting.

Learning Outcomes

Students will be able to:

- understand how to join Zoom meetings.
- learn the steps to participate in Zoom meetings effectively.
- develop skills in virtual collaboration and communication.

Resources

- Computers or tablets with internet access
- Zoom accounts (free version)
- Projector or interactive whiteboard
- Headphones or microphones (optional)

Methodology

- **Background Information**

  Zoom is a video conferencing tool that allows users to meet and collaborate virtually. It provides features like screen sharing, chat, and reactions to facilitate online interaction. Understanding how to join and participate in Zoom meetings is essential for effective virtual collaboration.

- **Introduction**

  Begin with a brief explanation of Zoom and its importance for virtual collaboration. Use an engaging analogy, such as comparing Zoom to a virtual classroom where students can meet and work together from different locations. Explain that today's lesson will focus on joining Zoom meetings and collaborating effectively online.

- **Guided Practice**

  Introduce the steps to join a Zoom meeting. Explain that joining a meeting involves clicking a link, entering a meeting ID, and using a password if required. For example, you can ask students, 'How can we join a Zoom meeting?' Students may respond: 'We can click the link and enter the meeting ID.' The teacher can follow up with: 'Exactly! Let's go through the steps together. First, click the link provided by the host. Then, enter the meeting ID and password if needed.'

- **Participating in Zoom Meetings**

  Discuss the importance of participating actively in Zoom meetings. Explain how to use features like mute/unmute, video on/off, chat, and reactions. For example, you can ask students, 'How can we participate in a Zoom meeting?' Students may respond: 'We can use the chat to ask questions and unmute to speak.' The teacher can follow up with: 'Great! Let's practice using these features. Try unmuting yourself and saying hello, then use the chat to type a question.'
- **Interactive Exploration**

  Guide students to troubleshoot common issues related to joining Zoom meetings, such as audio/video problems and connectivity issues. For example, you can ask, 'What should we do if we can't hear the audio in a Zoom meeting?' Students may respond: 'We can check our microphone and speaker settings.' The teacher can follow up with: 'Exactly! Let's go through the steps to check our audio settings. If the problem persists, we can try restarting Zoom or our device.'
- **Challenge Task**

  Assign a task where students use Zoom to collaborate on a project. For example, you can ask, 'Let's join a Zoom meeting for our class project. How can we share our ideas and work together effectively?' Students may respond: 'We can use the screen share feature to show our work and discuss it.' The teacher can follow up with: 'Great! Let's practice sharing our screens and collaborating on the project.'
- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their project and explain how they used Zoom to collaborate. Use an exit ticket where students write one thing they learned and one question they still have about using Zoom. Students can answer question 2b on page 58.

Performance Indicators

Students can:

- join Zoom meetings using the provided steps.
- understand how to participate actively in Zoom meetings.
- demonstrate the ability to troubleshoot common issues related to Zoom.

Lesson Plan 4

Topic: Understanding Internet Threats

Pages: 55-56

Core Competencies

1. **Digital Literacy:** Students will develop skills in understanding and practicing online classroom etiquette. They will learn to identify and protect themselves from internet threats.
2. **Communication Skills:** Students will learn to communicate respectfully and effectively in an online environment. They will develop strategies for positive online interactions.
3. **Critical Thinking:** Students will analyse different types of internet threats and evaluate ways to stay safe online. They will learn to question suspicious activities and make informed decisions.
4. **Problem-Solving:** Students will learn to identify and address issues related to internet threats. They will develop strategies for protecting themselves and others online.

Learning Outcomes

Students will be able to:

- understand the importance of online classroom etiquette.
- learn to identify and protect themselves from internet threats such as phishing, cyberbullying, and ransomware.
- develop skills in safe and respectful online communication.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- Chart paper and markers
- Educational videos on internet safety (optional)

Methodology

- **Background Information**

  Online classroom etiquette involves respectful behavior, active participation, and proper use of digital tools. Internet threats, including phishing, cyberbullying, and ransomware, pose significant risks to users. Understanding these threats and practicing good online manners are essential for a safe and positive digital experience.

- **Introduction**

  Begin with a brief explanation of the importance of online classroom etiquette. Use an engaging analogy, such as comparing online etiquette to the rules of a game where everyone needs to follow the rules to have fun and stay safe. Explain that today's lesson will focus on practicing good online etiquette and understanding internet threats.

- **Guided Practice**

  Introduce the concept of online classroom etiquette by discussing respectful behavior, active participation, and proper use of digital tools. For example, ask students about good manners to follow in an online classroom. They might suggest muting microphones when not speaking and raising hands to ask questions. You can then explain that muting microphones helps reduce background noise, and raising hands ensures everyone gets a chance to speak. Create a bingo card with various online etiquette behaviors (e.g., muting the microphone, raising your hand, using chat respectfully). Have students mark off behaviors they observe during a Zoom session. Discuss the importance of each behavior after the activity.

- **Internet Threats: Phishing**

  Discuss phishing and how it involves tricking individuals into disclosing personal information. Explain that phishing can happen through emails, messages, or fake websites. Ask students what phishing is and how to recognise it. They might say phishing is when someone tries to steal information by pretending to be someone else. You can follow up by explaining that phishing can be recognised by looking for suspicious links and messages asking for personal information.

Create a mock phishing email and show it to the class. Identify the red flags that indicate a potential phishing attempt. Have students work in pairs to identify these red flags and share their findings with the class.

- **Internet Threats: Cyberbullying**

  Discuss cyberbullying and its impact on individuals. Explain that cyberbullying involves using digital platforms to harass or intimidate others. Ask students what cyberbullying is and how to prevent it. They might say cyberbullying is when someone is mean to others online and can be prevented by being kind and reporting any bullying. You can follow up by emphasising the importance of kindness online and reporting bullying to a trusted adult.

  Divide students into small groups and give them different scenarios involving cyberbullying. Have them role-play the scenarios and discuss how to handle each situation. Emphasise the importance of reporting bullying and being kind online.

- **Internet Threats: Ransomware**

  Discuss ransomware and how it involves locking users out of their data until a ransom is paid. Explain that ransomware can be spread through malicious links or downloads. Ask students what ransomware is and how to protect themselves from it. They might say ransomware is when someone locks files and asks for money to unlock them, and protection involves not clicking on suspicious links. You can follow up by advising caution with links and downloads and keeping software updated.

  Have students create posters that explain what ransomware is and how to protect against it. Display the posters around the classroom or share them digitally. Discuss the key points from each poster and reinforce the importance of being cautious online.

- **Challenge Task**

  Assign a task where students create a poster or presentation on online classroom etiquette and internet threats. Ask them to include tips for respectful behavior and ways to recognise phishing, cyberbullying, and ransomware. Students might suggest including tips for good online manners and safety measures. You can guide them in creating an informative poster.

- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their poster or presentation and explain the key points of online classroom etiquette and internet threats. Use an exit ticket where students write one thing they learned and one question they still have about internet safety. Students can now answer question 2c and the second activity from the application-based questions and the Group project on page 58.

Performance Indicators

Students can:

- explain the importance of online classroom etiquette.
- identify and understand different types of internet threats.
- demonstrate the ability to practice safe and respectful online communication.

APPLICATION BASED QUESTIONS

Activity 1

Imagine you have a group project, and your team members are in different locations. How can Google Drive help in collaborating on the project?

Instructions

- Explain the activity's goal: to understand how Google Drive can help in collaborating on a group project with team members in different locations.
- Discuss the importance of collaboration and effective communication in group projects.
- Present the scenario to the students: 'Imagine you have a group project, and your team members are in different locations. How can Google Drive help in collaborating on the project?'
- Ask each group to brainstorm how Google Drive can help in collaborating on the project. Encourage them to consider:
  - Sharing documents and files
  - Real-time editing and commenting
  - Organising project materials in folders
  - Accessing files from any location
- Guide students to use Google Drive to create a shared folder for their group project.
- Have students create and share documents, presentations, and other project materials within the shared folder.
- Encourage students to practice real-time editing and commenting on each other's work.
- Walk around the classroom to assist students with any technical difficulties and provide guidance as needed.
- Guide students to discuss their progress, share ideas, and assign tasks for the project.
- Gather the students and have each group present their collaborative work and discuss how Google Drive helped in the process.
- Use Socratic questioning to guide the discussion and deepen understanding:
  - 'How did Google Drive make it easier to collaborate with team members in different locations?'
  - 'What features of Google Drive were most helpful for your project?'
  - 'How did real-time editing and commenting improve your collaboration?'
  - 'What challenges did you face while using Google Drive, and how did you overcome them?'
- Encourage students to think critically about the advantages and challenges of using Google Drive for collaboration.

Activity 2

You receive a suspicious-looking email asking for your password. What steps would you take to handle this situation?

Instructions

- Explain the activity's goal: to understand how to handle suspicious emails and protect personal information.
- Discuss the importance of email security and the risks associated with phishing attempts.
- Present the scenario to the students: 'You receive a suspicious-looking email asking for your password. What steps would you take to handle this situation?'
- Divide students into small groups (3-4 students per group).
- Provide each group with paper and pencils to take notes.
- Ask each group to brainstorm the steps they would take to handle the suspicious email. Encourage them to consider:
  - Identifying signs of a phishing email (e.g., unfamiliar sender, urgent language, suspicious links)
  - Not clicking on any links or downloading attachments
  - Reporting the email to a trusted adult or IT department
  - Deleting the email
- Have each group write down their ideas and be prepared to share them with the class.
- Provide examples of suspicious emails (printed or digital) for students to analyse.
- Guide students to identify signs of phishing in the examples provided.
- Walk around the classroom to assist students with any questions and provide guidance as needed.
- Gather the students and have each group present their findings on the suspicious emails.
- Use Socratic questioning to guide the discussion and deepen understanding:
  - 'What signs did you notice that made the email look suspicious?'
  - 'Why is it important not to click on links or download attachments from unknown senders?'
  - 'What should you do if you receive a suspicious email?'
  - 'How can you protect your personal information online?'
- Encourage students to think critically about email security and the steps they should take to stay safe.
- Have students role-play different scenarios involving suspicious emails.
- Assign roles such as the email recipient, the trusted adult, and the IT department.
- Guide students through the steps they should take in each scenario, reinforcing the importance of reporting and deleting suspicious emails.

- Summarise the key points discussed during the activity:
  - The importance of email security and identifying phishing attempts
  - The steps to take when handling suspicious emails
  - The need for critical thinking and vigilance in protecting personal information
- Have students reflect on what they learned and write a short paragraph about the importance of email security.
- Encourage students to share what they learned with their family and friends to promote safe online practices.

GROUP PROJECT

Activity

Create a collaborative presentation using Google Drive to showcase the advantages of cloud computing. Each team member should contribute at least one slide highlighting a specific advantage. Use Zoom for a virtual brainstorming session to plan the presentation. Ensure that everyone follows proper online class etiquette during the collaboration. The final presentation should be uploaded to Google Drive and shared with the entire class.

Instructions

- Explain the activity's goal: to create a collaborative presentation showcasing the advantages of cloud computing.
- Discuss the importance of cloud computing in today's world and how it benefits various industries and everyday life.
- Introduce the tools (Google Drive and Zoom) and explain how they will be used for collaboration.
- Use Zoom for a virtual brainstorming session to plan the presentation.
- Ensure that everyone follows proper online class etiquette, such as muting microphones when not speaking and using the chat function for questions.
- Guide students to discuss and decide on the specific advantages of cloud computing they want to highlight in their presentation.
- Encourage each team member to contribute ideas and take notes during the session.
- Divide students into small groups (3-4 students per group).
- Each team member should create at least one slide highlighting a specific advantage of cloud computing.
- Provide visual aids, step-by-step guides, and video tutorials to help students create their slides.

- Monitor progress and offer assistance as needed to ensure all students are participating and contributing.
- Guide students to use Google Drive to upload and integrate their individual slides into a single collaborative presentation.
- Encourage students to review each other's slides and provide constructive feedback.
- Use collaborative tools like shared online documents or platforms where students can work together in real-time.
- Have students practice presenting their slides to the group.
- Use Socratic questioning to guide the discussion and deepen understanding:
  - 'Why is this advantage of cloud computing important?'
  - 'How does cloud computing benefit individuals and businesses?'
  - 'What are some real-world examples of cloud computing in action?'
- Encourage students to think critically about the advantages they are presenting.
- Ensure the final presentation is uploaded to Google Drive and shared with the entire class.
- Discuss the importance of collaboration and teamwork in creating the presentation.
- Provide positive feedback and encourage students to think deeply about their experiences.
- Summarise the key points discussed during the activity:
  - The advantages of cloud computing
  - The value of collaboration and teamwork
  - The importance of proper online class etiquette
- Have students reflect on what they learned and write a short paragraph about the importance of cloud computing and collaboration.

Engagement Activities

Phishing Detective

- Show examples of phishing emails and ask students to identify red flags.

Cyberbullying Skits

- Students act out cyberbullying scenarios and discuss how to respond.

Google Drive Scavenger Hunt

- Create a simple Google Drive with pre-made files and folders. Students follow clues to find specific items.

Riddles

1. I store your files, but have no shelves, I'm everywhere, but have no cells. What am I?
   Answer: Cloud computing
2. I grow bigger when you need more space, I'm always there, at any time and place. What am I?
   Answer: Scalability
3. I hold your files, in folders so neat, you can search and find them, with digital feet. What am I?
   Answer: Google Drive
4. I help you find things, when you have many files, by date or name, I help you compile.
   Answer: Filters
5. I bring people together, even when far away, with video and sound, I brighten your day. What am I?
   Answer: Zoom
6. I am the rules of the online room, to keep things nice and to reduce the gloom.
   Answer: Online etiquette
7. I try to trick you, with fake emails and links, to steal your information, in digital blinks. What am I?
   Answer: Phishing
8. I am mean words, online or in texts, I hurt people's feelings, and cause them stress.
   Answer: Cyberbullying

Application-Based Scenario

1. Imagine you're working on a school project with friends. You need to share a big video. How can cloud storage help you?
2. You have many pictures from a school trip. How would you organise them in Google Drive?
3. You are in a Zoom meeting, and your little brother is making noise. What should you do?
4. You receive an email from someone you don't know, asking for your password. What should you do?

Answer for Exercise

5. Choose the correct answer:

a. Delivery of services like storage and applications over the Internet

b. Search for files and folders

c. Online Meetings

6. Answer the following questions.

a. Google Drive helps you keep your digital things neat. We can create folders, just like we do in our room, and store all our schoolwork, pictures, and other files inside them. You can also use the search bar to find things quickly, so we don't miss anything.

b. The answers may vary because the students should be encouraged to write in their own words. It should include the following points: To join a Zoom meeting, we usually get a link from our teacher or friend. We click on the link, and then we may need to enter a password. When we join, we can choose whether to enable or disable your camera and microphone. We can also see and hear everyone else in the meeting, and sometimes we can use the chat box to type messages.

c. The answers may vary because the students should be encouraged to write in their own words. It should include the following points: Some things on the internet can be tricky. Some people may try to trick you into giving them your personal information, such as your name or address. Sometimes you might see things that are not nice. To stay safe, you should:

- Always ask a grown-up before sharing any information online.
- Only visit websites that your teacher or parents say are okay.
- Don't talk to strangers online.
- If you see something that makes you feel uncomfortable, tell a grown-up right away.

CHAPTER
6

INTRODUCTION TO CODING AND AI

Learning Outcomes

Students will be able to:

- understand the definition of artificial intelligence.
- identify applications of AI in daily life, such as voice assistants and personalised search results.
- learn how AI works, including concepts like machine learning, patterns, and training data.
- recognise uses of machine learning in daily life, such as internet search results, spam filters, recommendation systems, auto-complete texts, voice recognition, and digital assistants.

Lesson Plan 1

Topic: Understanding Artificial Intelligence

Pages: 59-61

Core Competencies

1. **Digital Literacy:** Students will develop an understanding of artificial intelligence (AI) and its applications in daily life. They will learn how AI works and its impact on various technologies.
2. **Critical Thinking:** Students will analyse the role of AI in everyday tasks and evaluate its benefits and challenges. They will learn to question how AI systems make decisions.
3. **Problem-Solving:** Students will learn to identify and address issues related to AI applications. They will develop strategies for using AI tools effectively.
4. **Creativity:** Students will explore innovative ways AI can be applied to solve problems. They will use their imagination to think about future AI applications.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- Chart paper and markers
- Educational videos on AI and machine learning (optional)

Methodology

- **Introduction**

  Begin with a brief explanation of artificial intelligence (AI). Use an engaging analogy, such as comparing AI to a robot that can learn and make decisions like a human. Explain that today's lesson will focus on understanding AI, its applications, and how it works.

- **Guided Practice**

  Definition of Artificial Intelligence

  Introduce the concept of AI by explaining that it involves creating machines that can perform tasks that typically require human intelligence. For example, ask students what they think AI means. They might say it's about robots or smart machines. You can then explain that AI includes technologies like voice assistants and personalised search results.

- **Applications of AI in Daily Life**

  Discuss various applications of AI, such as voice assistants (e.g., Siri, Alexa), personalised search results, and recommendation systems. Ask students to share examples of AI they use or see in their daily lives. They might mention using voice assistants to set reminders or getting personalised recommendations on YouTube. You can follow up by explaining how these AI applications make tasks easier and more efficient.

- **How AI Works: Machine Learning, Patterns, Training Data**

  Explain the basics of how AI works, focusing on machine learning, patterns, and training data. For example, ask students how they think a voice assistant understands their commands. They might say it listens and learns. You can then explain that AI systems learn from data and recognise patterns to make decisions. Use simple examples, like teaching a computer to recognise pictures of cats by showing it many cat images (training data).

- **Interactive Exploration**

  Show a video or demonstration of a voice assistant responding to commands. Examine how the AI processes commands and generates responses. Ask students to think about what happens behind the scenes. They might say the assistant listens and finds answers. You can explain that the AI uses machine learning to understand and respond accurately.

  Conduct a search on a search engine and show how personalised results appear. Discuss how AI tailors these results based on previous searches and user preferences. Ask students to share their experiences with personalised search results. They might mention seeing ads for things they recently searched for. You can explain that AI uses patterns in their search history to provide relevant results.

- **Challenge Task**

  Have students create a simple AI model using an online tool like Teachable Machine. Guide them to train the model with images or sounds and test its accuracy. For example, ask students to train the model to recognise different objects or sounds. They might use pictures of different animals. You can follow up by discussing how the model learns from the training data and improves its accuracy.

- **Wrap-Up Assessment and Exit Ticket**

  Have each group present its AI model and explain how it was trained and tested for accuracy. Use an exit ticket where students write one thing they learned and one question they still have about AI. Students can now answer questions 2a, 2 b, and 2f on page 77.

Performance Indicators

Students can:

- explain the definition of artificial intelligence.
- identify applications of AI in daily life.
- understand how AI works, including machine learning, patterns, and training data.
- demonstrate the ability to create and test a simple AI model.

Lesson Plan 2

Topic: Training an AI Bot and Understanding Machine Learning

Pages: 62-65

Core Competencies

1. **Digital Literacy:** Students will develop skills in training an AI bot using code.org lessons. They will learn the principles of machine learning and its applications.
2. **Critical Thinking:** Students will analyse the strengths and limitations of machine learning. They will evaluate how machine learning models make decisions and the impact of these decisions.
3. **Problem-Solving:** Students will learn to identify and address issues related to training AI models. They will develop strategies for improving model accuracy and performance.
4. **Creativity:** Students will explore innovative ways to apply machine learning principles. They will use their imagination to think about future applications and improvements.

Learning Outcomes

Students will be able to:

- learn the steps to train an AI bot using code.org lessons.
- understand the principles of machine learning and how it is applied.
- identify the strengths and limitations of machine learning.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- code.org accounts (free version)
- Chart paper and markers

Methodology

- **Background Information**

  Machine learning is a subset of artificial intelligence that involves training models with data to recognise patterns and make decisions. code.org provides interactive lessons that help students understand and apply machine learning principles. Understanding the strengths and limitations of machine learning is essential for evaluating its impact on technology and society.

- **Introduction**

  Begin with a brief explanation of artificial intelligence (AI) and machine learning. Use an engaging analogy, such as comparing AI to a student who learns from examples to improve their skills. Explain that today's lesson will focus on training an AI bot and understanding the strengths and limitations of machine learning.

- **Guided Practice: Steps to Train an AI Bot in code.org Lessons**

  Introduce the steps to train an AI bot using code.org lessons. Explain that training involves providing the bot with examples and feedback to improve its performance. For example, ask students how they think an AI bot learns. They might say it learns from data or examples. You can then explain that the bot uses these examples to recognise patterns and make decisions.

- **Step-by-Step Training Process**:

1. Access code.org: Guide students to log in to their code.org accounts and navigate to the AI and machine learning lessons.
2. Select a Lesson: Have students select a lesson that involves training an AI bot, such as recognising images or sorting data.
3. Provide Examples: Explain that students will provide the bot with labelled examples (e.g., images of cats and dogs) to help it learn. Demonstrate how to upload or select examples in the lesson.
4. Train the Bot: Show students how to start the training process and provide feedback to the bot. Explain that the bot will use the examples to improve its accuracy.
5. Test the Bot: Guide students to test the bot with new examples to see how well it has learned. Discuss the results and any improvements needed.

- **Interactive Exploration: Training the AI Bot**

  Have students work in pairs to train an AI bot using code.org lessons. Provide guidance and support as they go through the steps. For example, ask students to train the bot to recognise different types of animals. They might use images of cats, dogs, and birds. You can follow up by discussing how the bot uses the training data to make predictions.
- **Testing and Improving the Bot**

  After training the bot, have students test it with new examples and evaluate its performance. Ask them to identify any mistakes the bot makes and suggest ways to improve its accuracy. For example, they might notice the bot confuses cats and dogs. You can discuss how providing more examples or refining the training data can help improve the bot's performance.
- **Challenge Task: Exploring Machine Learning Applications**

  Assign a task that allows students to explore various applications of machine learning, such as internet search results, spam filters, recommendation systems, auto-complete features, voice recognition, and digital assistants. Have them create a presentation or poster explaining how machine learning is used in these applications and its strengths and limitations. For example, students might explain how YouTube's recommendation systems suggest videos based on a user's viewing history. They can discuss the strengths, such as personalised content, and limitations, such as potential biases.
- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their trained AI bot and their exploration of machine learning applications. Use an exit ticket where students write one thing they learned and one question they still have about machine learning. Students can do the first Application-based question activity on page 78.

Performance Indicators

Students can:

- explain the steps to train an AI bot using code.org lessons.
- understand the principles of machine learning and its applications.
- identify the strengths and limitations of machine learning.

Lesson Plan 3

Topic: Understanding Data Bias and Teaching AI Bot Patterns

Pages: 65-67

Core Competencies

1. **Digital Literacy:** Students will develop an understanding of data bias and its impact on AI. They will learn how to teach AI bots to recognise patterns.
2. **Critical Thinking:** Students will analyse the effects of data bias on AI decisions. They will evaluate how biased data can lead to inaccurate or unfair outcomes.

3. **Problem-Solving:** Students will learn to identify and address issues related to data bias. They will develop strategies for ensuring fair and accurate AI models.
4. **Creativity:** Students will explore innovative ways to teach AI bots patterns. They will use their imagination to devise ways to improve AI training processes.

Learning Outcomes

Students will be able to:

- understand the concept of data bias and its impact on AI.
- learn how to teach AI bots to recognise patterns.
- identify strategies to mitigate data bias in AI models.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- code.org accounts (free version)
- Chart paper and markers

Methodology

- **Background Information**

  Data bias occurs when the data used to train AI models is not representative of the real world, leading to inaccurate or unfair outcomes. Teaching AI bots to recognise patterns involves providing diverse and representative examples. Understanding and mitigating data bias is essential for creating fair and accurate AI models.

- **Introduction**

  Begin with a brief explanation of data bias and its impact on AI. Use an engaging analogy, such as comparing data bias to a skewed scale that gives inaccurate measurements. Explain that today's lesson will focus on understanding data bias and teaching AI bots to recognise patterns.

- **Guided Practice: Understanding Data Bias**

  Introduce the concept of data bias by explaining that it occurs when the data used to train AI models is not representative of the real world. For example, ask students what they think data bias means. They might say it's when data is unfair or inaccurate. You can then explain that biased data can lead to AI making incorrect or unfair decisions.

- **Examples of Data Bias**

  Discuss examples of data bias, such as biased facial recognition systems or unfair loan approval algorithms. Ask students to consider how biased data can impact these systems. They might mention that facial recognition might not work well for certain groups of people. You can follow up by explaining that biased data can lead to discrimination and unfair treatment.

- **Interactive Exploration: Identifying Data Bias**

  Show students a dataset and guide them to identify potential biases. For example, use a dataset of images that predominantly features one group of people. Ask students to analyse the dataset and discuss any biases they find. They might notice that the dataset lacks diversity. You can explain how this lack of diversity can lead to biased AI models.

- **Teaching AI Bot Patterns**

  Introduce the steps to teach AI bots patterns using code.org lessons. Explain that teaching involves providing the bot with diverse and representative examples. For example, ask students how they think an AI bot learns patterns. They might say it learns from examples. You can then explain that the bot needs diverse examples to learn accurately.

1. Access code.org: Guide students to log in to their code.org accounts and navigate to the AI and machine learning lessons.
2. Select a Lesson: Have students select a lesson that involves teaching an AI bot patterns, such as recognising different objects or sorting data.
3. Provide Diverse Examples: Explain that students will provide the bot with diverse and representative examples to help it learn. Demonstrate how to upload or select diverse examples in the lesson.
4. Teach the Bot: Show students how to start the teaching process and provide feedback to the bot. Explain that the bot will use the diverse examples to improve its accuracy.
5. Test the Bot: Guide students to test the bot with new examples to see how well it has learned. Discuss the results and any improvements needed.

- **Challenge Task: Mitigating Data Bias**

  Assign a task where students explore strategies to mitigate data bias in AI models. Have them create a presentation or poster explaining these strategies. For example, students might suggest using diverse datasets, regularly updating training data, and testing models for fairness. They can discuss how these strategies help ensure fair and accurate AI models.

- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their findings on data bias and their strategies to mitigate it. Use an exit ticket where students write one thing they learned and one question they still have about data bias and AI. Students will be able to engage in the second and third activities of Application-based questions and the second Group Project activity on page 78.

Performance Indicators

Students can:

- explain the concept of data bias and its impact on AI.
- understand how to teach AI bots to recognise patterns.
- identify strategies to mitigate data bias in AI models.

Lesson Plan 4

Topic: Applications of AI in Daily Life

Pages: 67-69

Core Competencies

1. **Digital Literacy:** Students will develop an understanding of how AI is applied in maps and navigation, chatbots, recommendations, and autonomous driving. They will learn about digital age mapping and geographical data.

2. **Critical Thinking:** Students will analyse the impact of AI on various technologies and evaluate its benefits and challenges. They will learn to question how AI systems make decisions.
3. **Problem-Solving:** Students will learn to identify and address issues related to AI applications. They will develop strategies for using AI tools effectively.
4. **Creativity:** Students will explore innovative ways AI can be applied to solve problems. They will use their imagination to think about future AI applications.

Learning Outcomes

Students will be able to:

- understand the use of AI in maps and navigation, chatbots, recommendations, and self-driving cars.
- learn about digital age mapping, including location and geographical data.
- identify examples of AI applications in daily life and their impact.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- Chart paper and markers
- Educational videos on AI applications (optional)

Methodology

- **Background Information**

  AI is integrated into various technologies, including maps and navigation, chatbots, recommendation systems, and self-driving cars. Digital age mapping involves using AI to analyse location and geographical data for various applications. Understanding these AI applications helps students appreciate the role of AI in improving daily tasks and decision-making.

- **Introduction**

  Begin with a brief explanation of how AI is integrated into various technologies we use daily. Use an engaging analogy, such as comparing AI to a helpful assistant that makes our tasks easier and more efficient. Explain that today's lesson will focus on understanding the use of AI in maps and navigation, chatbots, recommendations, self-driving cars, and digital age mapping.

- **Guided Practice: AI in Maps and Navigation**

  Introduce the concept of AI in maps and navigation by explaining how AI helps provide real-time traffic updates, optimise routes, and offer location-based services. For example, ask students how they think their navigation apps find the best routes. They might say it uses traffic data. You can then explain that AI analyses traffic patterns and suggests the quickest routes.

- **AI in Chatbots**

  Discuss how AI-powered chatbots assist with customer service, answering questions, and providing information. Ask students if they have ever interacted with a chatbot. They might mention using chatbots on websites for help. You can explain that AI enables chatbots to understand and respond to user queries efficiently.

- **AI in Recommendations**

  Explain how AI is used in recommendation systems to suggest products, movies, or music based on user preferences. Ask students if they have ever received recommendations on platforms like YouTube or Netflix. They might say they get video suggestions. You can explain that AI analyses their viewing history to provide personalised recommendations.
- **AI in Self-Driving Cars**

  Discuss the role of AI in self-driving cars, including object detection, decision-making, and navigation. Ask students how they think self-driving cars operate. They might say the cars use sensors. You can explain that AI processes data from sensors to navigate safely and make driving decisions.
- **Interactive Exploration: Exploring AI in Maps and Navigation**

  Demonstrate a navigation app utilising AI to deliver real-time traffic updates. Discuss how the app uses AI to optimise routes. Ask students to think about how AI improves their travel experience. They might mention avoiding traffic jams. You can explain that AI helps save time and reduce travel stress.
- **Chatbot Simulation**

  Have students work in pairs to create a simple chatbot using an online tool like Scratch. Guide them to program the chatbot to answer basic questions. For example, ask students to create a chatbot that provides information about their school. They might program the chatbot to answer questions about school hours and activities. You can follow up by discussing how AI enables chatbots to assist users.
- **Challenge Task: Recommendation System Exploration**

  Assign a task where students explore how recommendation systems work on platforms like YouTube or Netflix. Have them create a presentation explaining how AI analyses user preferences to provide recommendations. For example, students might explain how AI suggests videos based on their viewing history. They can discuss the benefits of personalised recommendations and potential privacy concerns.
- **Self-Driving Car Simulation**

  Show a video or simulation of a self-driving car in action. Discuss how AI processes data from sensors to navigate and make decisions. Ask students to think about the advantages and challenges of self-driving cars. They might mention safety and technology reliability. You can explain that AI aims to improve road safety and driving convenience.
- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their findings on AI applications and their impact. Use an exit ticket where students write one thing they learned and one question they still have about AI in daily life. Students can now respond to questions 2c and 2d on page 77.

Performance Indicators

Students can:

- explain the use of AI in maps and navigation, chatbots, recommendations, and self-driving cars.
- understand digital age mapping, including location and geographical data.
- identify examples of AI applications in daily life and their impact.

Lesson Plan 5

Topic: Exploring Sprite Lab Interface and Coding

Pages: 70-71

Core Competencies

1. **Digital Literacy:** Students will develop skills in using the Sprite Lab interface on code.org. They will learn how to add and delete code to create and modify projects.
2. **Critical Thinking:** Students will analyse the impact of their coding decisions on the behavior of sprites. They will evaluate how different codes affect the outcomes of their projects.
3. **Problem-Solving:** Students will learn to identify and address coding-related issues in Sprite Lab. They will develop strategies for debugging and improving their code.
4. **Creativity:** Students will explore innovative ways to use sprites and coding to create interactive projects. They will use their imagination to design unique and engaging animations.

Learning Outcomes

Students will be able to:

- understand the Sprite Lab interface on code.org.
- add and delete codes in Sprite Lab.
- develop skills in creating and modifying projects using sprites and coding.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- code.org accounts (free version)
- Chart paper and markers

Methodology

- **Background Information**

  Sprite Lab on code.org is a platform that allows students to create and animate characters (sprites) using blocks of code. Understanding how to add and delete codes helps students control the behavior of sprites and create interactive projects. Exploring the Sprite Lab interface and experimenting with code blocks fosters creativity and problem-solving skills

- **Introduction**

  Begin with a brief explanation of Sprite Lab on code.org. Use an engaging analogy, such as comparing Sprite Lab to a digital playground where students can create and control characters (sprites) using code. Explain that today's lesson will focus on exploring the Sprite Lab interface and learning how to add and delete codes.

- **Guided Practice: Exploring the Sprite Lab Interface**

  Introduce the Sprite Lab interface by guiding students through its main features. Explain that Sprite Lab allows them to create and animate sprites using blocks of code. For example, ask students what they think they can do in Sprite Lab. They might say they can create characters and

make them move. You can then explain that Sprite Lab provides tools to design, animate, and control sprites.

- **Step-by-Step Exploration**

1. Access code.org: Guide students to log in to their code.org accounts and navigate to the Sprite Lab.
2. Create a New Project: Show students how to start a new project in Sprite Lab. Explain the different sections of the interface, such as the workspace, toolbox, and stage.
3. Add Sprites: Demonstrate how to add sprites to the stage. Explain that sprites are characters or objects that can be animated and controlled.
4. Animate Sprites: Show students how to use code blocks to animate sprites. Explain how different blocks can make sprites move, change appearance, or interact with each other.

- **Interactive Exploration: Adding Codes**

  Have students work in pairs to add codes to their sprites in Sprite Lab. Provide guidance and support as they experiment with different code blocks. For example, ask students to make their sprites move across the stage. They might use blocks like 'move 10 steps' or 'turn 15 degrees.' You can follow up by discussing how these codes affect the behavior of the sprites.

- **Deleting Codes**

  Show students how to delete codes from their projects. Explain that deleting codes can help fix mistakes or change the behavior of sprites. For example, ask students to remove a code block that makes a sprite move too fast. They might drag the block to the trash can icon. You can discuss how deleting codes can help improve their projects.

- **Challenge Task: Creating an Interactive Animation**

  Assign a task where students create an interactive animation using sprites and code blocks. Have them design a scene where sprites interact with each other based on user input. For example, students might create a game where sprites move when the player clicks on them. They can use blocks like 'when sprite clicked' and 'move 10 steps.' You can follow up by discussing how coding allows them to create interactive and engaging projects.

- **Wrap-Up Assessment and Exit Ticket**

  Have each group present their interactive animation and explain how they used code blocks to control the sprites. Use an exit ticket where students write one thing they learned and one question they still have about coding in Sprite Lab. Students can now complete question 2e and the first activity of the Group Project on page 78.

Performance Indicators

Students can:

- explain the Sprite Lab interface on code.org.
- understand how to add and delete codes in Sprite Lab.
- demonstrate the ability to create and modify projects using sprites and coding.

Lesson Plan 6

Topic: Map Interaction and Moving the Guide in Code.org

Pages: 72-75

Core Competencies

1. **Digital Literacy:** Students will develop skills in interacting with maps and moving guides in code.org lessons. They will learn how to use coding to control map elements.
2. **Critical Thinking:** Students will analyse the impact of their coding decisions on map interactions. They will evaluate how different codes affect the movement and behavior of guides.
3. **Problem-Solving:** Students will learn to identify and address issues related to coding in map interactions. They will develop strategies for debugging and improving their code.
4. **Creativity:** Students will explore innovative ways to use coding to create interactive map projects. They will use their imagination to design unique and engaging map interactions.

Learning Outcomes

Students will be able to:

- understand how to interact with maps in code.org lessons.
- move guides using coding blocks.
- develop skills in creating and modifying map-based projects using coding.

Resources

- Computers or tablets with internet access
- Projector or interactive whiteboard
- code.org accounts (free version)
- Chart paper and markers

Methodology

- **Background Information**

  Map interaction in code.org involves using coding blocks to control elements on a map, such as guides or markers. Understanding how to move guides and interact with map elements helps students create dynamic and interactive projects. Exploring map interaction and experimenting with coding blocks fosters creativity and problem-solving skills.

- **Introduction**

  Begin with a brief explanation of map interaction and moving guides in code.org. Use an engaging analogy, such as comparing map interaction to a treasure hunt where students use coding to navigate and find treasures. Explain that today's lesson will focus on interacting with maps and moving guides using coding blocks.

- **Guided Practice: Exploring Map Interaction**

  Introduce the concept of map interaction by guiding students through the main features of map-based projects in code.org. Explain that map interaction involves using coding blocks to control elements on a map. For example, ask students what they think they can do with maps in code.org. They might say they can move characters or find locations. You can then explain that map interaction allows them to create dynamic and interactive map projects.

- **Step-by-Step Exploration:**
  1. Access code.org: Guide students to log in to their code.org accounts and navigate to a map-based lesson.
  2. Create a New Project: Show students how to start a new map project. Explain the different sections of the interface, such as the workspace, toolbox, and map area.
  3. Add Map Elements: Demonstrate how to add elements to the map, such as guides or markers. Explain that these elements can be controlled using coding blocks.
  4. Interact with the Map: Show students how to use code blocks to interact with the map. Explain how different blocks can move guides, change map elements, or trigger actions.
- **Interactive Exploration: Moving the Guide**

Have students work in pairs to move guides on the map using coding blocks. Provide guidance and support as they experiment with different code blocks. For example, ask students to move their guides to specific locations on the map. They might use blocks like 'move to x, y coordinates' or 'move 10 steps.' You can follow up by discussing how these codes affect the movement of the guides.

- **Interacting with Map Elements**

Show students how to interact with other elements on the map, such as collecting items or triggering events. Explain that interacting with map elements can make their projects more engaging. For example, ask students to create a project where the guide collects items on the map. They might use blocks like 'when guide touches item, collect item.' You can discuss how coding allows them to create interactive and dynamic map projects.

- **Challenge Task: Creating an Interactive Map Project**

Assign a task where students create an interactive map project using guides and coding blocks. Have them design a scene where the guide navigates the map and interacts with various elements. For example, students might create a treasure hunt game where the guide collects treasures and avoids obstacles. They can use blocks like 'when guide touches treasure, score points' and 'when guide touches obstacle, lose points.' You can follow up by discussing how coding allows them to create fun and interactive map-based projects.

- **Wrap-Up Assessment and Exit Ticket**

Have each group present their interactive map project and explain how they used code blocks to control the guides and interact with the map elements. Use an exit ticket where students write one thing they learned and one question they still have about coding in map-based projects. Students can now respond to question 1 on page 76 and complete the In the Lab activity on page 77.

Performance Indicators

Students can:

- explain how to interact with maps in code.org lessons.
- understand how to move guides using coding blocks.
- demonstrate the ability to create and modify map-based projects using coding.

IN THE LAB

Activity 1

Complete all the modules of the course Coding Interactive Maps assigned by your teacher. Visit the course AI for Oceans. Complete all tasks of the course.

After completing the course, reflect on the following questions:

1. Explain your favourite part of your project.
2. What was a useful block of code in your project?
3. Explain one bug or challenge you faced when building your project.
4. How did you fix the bug or overcome the challenge?
5. What changes would you still like to make to improve your project?

Instructions

- Discuss the importance of coding and AI in today's world and how these courses will help students understand these concepts.
- Introduce differentiated instruction strategies and real-world applications of coding and AI.
- Guide students to access and complete all modules of the course 'Coding Interactive Maps' assigned by the teacher.
- Encourage students to visit the course 'AI for Oceans' and complete all tasks.
- Walk around the classroom to assist students with any technical difficulties and provide guidance as needed.
- Offer additional support for students who need it and extension activities for advanced learners.
- After completing the courses, have students reflect on the following questions:
    1. Explain your favourite part of your project.
    2. What was a useful block of code in your project?
    3. Explain one bug or challenge you faced when building your project.
    4. How did you fix the bug or overcome the challenge?
    5. What changes would you still like to make to improve your project?
- Provide paper and pencils for students to write their reflections.
- Encourage students to think deeply about their experiences and provide detailed answers.
- Divide students into small groups of 3-4 students each.
- Have each group share their reflections.
- Encourage students to discuss their favourite parts, useful blocks of code, challenges faced, solutions found, and potential improvements.

- Use open-ended questions to stimulate discussion and critical thinking.
- Gather the students and have each group present their reflections to the class.
- Use Socratic questioning to guide the discussion and deepen understanding:
  - 'Why was this part of your project your favourite?'
  - 'How did this block of code help you achieve your goal?'
  - 'What made this bug or challenge difficult to overcome?'
  - 'What steps did you take to fix the bug or overcome the challenge?'
  - 'How would these changes improve your project?'
- Encourage students to think critically about their coding and AI experiences.
- Discuss how coding and AI are used in various professions, such as software development, data analysis, and robotics.
- Show videos or invite guest speakers to discuss their experiences with coding and AI in their work.
- Encourage students to think about how the skills they learned can be applied to real-world scenarios.
- Have students reflect on what they learned and write a short paragraph about the importance of coding and AI.
- Encourage students to continue exploring coding and AI projects and apply their skills to new challenges.

APPLICATION BASED QUESTIONS

Activity 1

A medical researcher trained an AI system by providing it with images of male X-rays only. The researcher uses the system to make predictions by testing it with female X-rays. Do you think the AI system will work well? What do you think the medical researcher should have considered?

Instructions

- Discuss the importance of diverse and representative training data in AI systems and how biases can affect predictions.
- Divide students into small groups (3-4 students per group).
- Provide each group with paper and pencils to take notes.
- Ask each group to brainstorm why the AI system might not work well with female X-rays and what the medical researcher should have considered. Encourage them to think about:

    - The differences between male and female X-rays
    - The importance of including diverse data in training
    - Potential biases in the training data
- Have each group write down their ideas and be prepared to share them with the class.
- Guide students to use computers or tablets to access image databases or online resources for collecting X-ray images of both males and females.
- Have students collect and organise the images into categories (male and female X-rays) and label them accurately.
- Walk around the classroom to assist students with any technical difficulties and provide guidance as needed.
- Gather the students and have each group present their collected and organised training data.
- Use Socratic questioning to guide the discussion and deepen understanding:
    - 'Why is it important to have a variety of images in the training data?'
    - 'How do differences between male and female X-rays affect the AI's ability to make accurate predictions?'
    - 'What are some examples of biases that could be present in the training data?'
    - 'How can we ensure that the AI system makes accurate predictions?'
- Encourage students to think critically about the importance of diverse and unbiased data in AI systems.
- Provide X-ray images for students to observe and examine. Have students record their observations, noting characteristics such as bone structure, density, and any noticeable differences between male and female X-rays. Then see how different the observations of the AI from theirs are.
- Encourage students to compare their observations with the images they collected online, discussing similarities and differences.
- Summarise the key points discussed during the activity:
    - The importance of diverse and representative training data in AI systems
    - How biases in data can affect AI predictions
    - The need for critical thinking when evaluating AI systems
- Have students reflect on what they learned and write a short paragraph about the importance of diverse data in AI.
- Encourage students to consider other areas where AI is utilised and how data quality affects its effectiveness.

Activity 2

You are assigned to train an AI system that can differentiate between fruits and vegetables. What training data will you provide to the system?

Instructions

- Explain the activity's goal: to train an AI system that can differentiate between fruits and vegetables by providing diverse and accurate training data.
- Discuss the importance of diverse and accurate data in AI systems and how it affects the system's ability to make correct predictions.
- Present the scenario to the students: 'You are assigned to train an AI system that can differentiate between fruits and vegetables. What training data will you provide to the system?'
- Divide students into small groups (3-4 students per group).
- Provide each group with paper and pencils to take notes.
- Ask each group to brainstorm what types of training data they would provide to the AI system. Encourage them to consider factors such as:
  - Variety of fruits and vegetables
  - Different angles and lighting conditions
  - Images with labels
- Have each group write down their ideas and be prepared to share them with the class.
- Provide visual aids, such as pictures of fruits and vegetables, to help students understand the differences.
- Offer extension activities for advanced learners, such as researching additional characteristics of fruits and vegetables that could be used in training data.
- Guide students to use computers or tablets to access image databases or online resources for collecting pictures of fruits and vegetables.
- Have students organise the collected images into categories (fruits and vegetables) and label them accurately.
- Walk around the classroom to assist students with any technical difficulties and provide guidance as needed.
- Gather the students and have each group present their collected and organised training data.
- Use Socratic questioning to guide the discussion and deepen understanding:
  - 'Why is it important to have a variety of images in the training data?'
  - 'How do different angles and lighting conditions affect the AI's ability to differentiate between fruits and vegetables?'
  - 'What are some examples of biases that could be present in the training data?'
  - 'How can we ensure that the AI system makes accurate predictions?'

- Encourage students to think critically about the importance of diverse and unbiased data in AI systems.
- Summarise the key points discussed during the activity:
  - The importance of diverse and accurate training data in AI systems
  - How biases in data can affect AI predictions
  - The need for critical thinking when evaluating AI systems
- Have students reflect on what they learned and write a short paragraph about the importance of diverse data in AI.
- Encourage students to think about other areas where AI is used and how data quality can impact its effectiveness.

Activity 3

An AI system is designed to predict the weather. However, you observe that it only predicts sunny weather. What do you think could be wrong here? Do you think the system works accurately?

Instructions

- Explain the activity's goal: to investigate why an AI system designed to predict the weather might only predict sunny weather.
- Discuss the importance of diverse data in AI systems and how biases can affect predictions.
- Present the scenario to the students: 'An AI system is designed to predict the weather. However, you observe that it only predicts sunny weather. What do you think could be wrong here? Do you think the system works accurately?'
- Divide students into small groups (3-4 students per group).
- Provide each group with paper and pencils to take notes.
- Ask each group to brainstorm possible reasons why the AI system might only predict sunny weather. Encourage them to consider factors such as:
  - The data used to train the AI system
  - Potential biases in the data
  - Limitations of the AI model
- Have each group write down their ideas and be prepared to share them with the class.
- Gather the students and have each group present their ideas.
- Use Socratic questioning to guide the discussion and deepen understanding:
  - 'What kind of data do you think was used to train the AI system?'
  - 'How might the data affect the AI's predictions?'
  - 'What are some examples of biases that could be present in the data?'
  - 'How can we ensure that an AI system makes accurate predictions?'

- Encourage students to think critically about the importance of diverse and unbiased data in AI systems.
- If available, provide access to a simple AI weather prediction tool.
- Allow students to input different types of weather data and observe the predictions.
- Discuss how changing the data affects the AI's predictions and what this reveals about the importance of diverse data.
- Summarise the key points discussed during the activity:
  - The importance of diverse and unbiased data in AI systems
  - How biases in data can affect AI predictions
  - The need for critical thinking when evaluating AI systems
- Have students reflect on what they learned and write a short paragraph about the importance of diverse data in AI.
- Encourage students to think about other areas where AI is used and how data quality can impact its effectiveness.

GROUP PROJECT

Activity 1

Choose a location to create your map. You may choose to create a map of your classroom, school or city. While planning your map, think about the backgrounds, sprites, and speech you will teach other people about the landmarks you have chosen. Access the Sprite Lab free play by opening Lesson 01: Map Making Introduction, Module 9, and create your map.

Instructions

- Explain the activity's goal: to create a digital map of a chosen location (classroom, school, or city) using Sprite Lab.
- Discuss the importance of planning and thinking about backgrounds, sprites, and speech to teach others about the landmarks.
- Have students decide whether they want to create a map of their classroom, school, or city.
- Ask students to list important landmarks they want to include in their map (e.g., desks, playground, library, famous buildings).
- Provide paper and pencils for students to sketch a rough layout of their map, including the placement of landmarks.
- Discuss how to choose appropriate backgrounds for their map. For example, a classroom map might have a background of desks and chairs, while a city map might have streets and buildings.

- Explain how to select and customise sprites to represent different landmarks. Encourage creativity in choosing sprites that best represent each landmark.
- Teach students how to add speech bubbles to their sprites to provide information about the landmarks. Discuss what information might be useful or interesting to include.
- Guide students to open Lesson 01: Map Making Introduction, Module 9 in Sprite Lab.
- Students use Sprite Lab to create their digital map based on their sketches. They will add backgrounds, place sprites, and include speech bubbles.
- Walk around the classroom to assist students with any technical difficulties and provide guidance as needed.
- Have each student or group present their digital map to the class.
- Use Socratic questioning to guide the discussion:
  - 'Why did you choose these particular landmarks?'
  - 'How did you decide on the placement of each landmark?'
  - 'What information did you include in the speech bubbles and why?'
  - 'How does your map help others understand the location better?'
- Provide positive feedback and constructive suggestions for improvement.
- Summarise the activity and reinforce the importance of planning and using digital tools to create informative maps.
- Discuss how the skills learned in this activity can be applied to other projects and subjects.

Activity 2

Collect pictures of either animal, fruits, sports, etc. In small groups, collect the pictures of the chosen theme and create a collage. Discuss how a varied range of pictures is similar to varied data for AI.

Instructions

- Explain the activity's goal: to collect pictures of a chosen theme (e.g., animals, fruits, sports) and create a collage.
- Discuss the importance of varied data in AI, using examples like how AI can recognise different types of animals, fruits, or sports.
- Introduce the assessment rubric and explain how students will be evaluated. Use design thinking principles to guide students through the activity.
- Empathise: Ask students to think about why it's important to have a variety of pictures. How does it help in understanding the theme better?
- Define: Have students define what their chosen theme is and what types of pictures they will look for.
- Ideate: Encourage students to brainstorm where they can find these pictures and how they will organise their collage.
- Divide students into small groups (3-4 students per group).

- Each group selects a theme (animals, fruits, sports, etc.).
- Assign specific roles within each group (e.g., researcher, designer, presenter).
- Groups collect pictures from magazines, newspapers, or print images from the internet. Alternatively, use tablets or computers to find images online and create digital collages.
- Students cut out the pictures and arrange them on a large sheet of paper or poster board to create a collage.
- Encourage students to discuss and decide together on the layout and design of their collage.
- Once the collages are complete, gather the students and have each group present their collage.
- Use Socratic questioning to guide the discussion:
    - 'Why did you choose these particular pictures?'
    - 'How do these pictures represent your theme?'
    - 'In what ways are these pictures similar or different?'
    - 'How does having a variety of pictures help in understanding the theme better?'
    - 'How can this concept be applied to AI and data collection?'
- Discuss real-world applications of AI and varied data, such as image recognition in social media, self-driving cars, or medical diagnostics.
- Summarise the activity and reinforce the idea that varied data is crucial for AI to recognise and understand different objects.
- Discuss how the activity helped them understand the importance of diverse data in AI.
- Encourage students to think about other ways they can collect and use varied data in their studies.

Engagement Activities

Pattern Detective

- Students can be given simple pattern worksheets (shapes, numbers). Discussion: How do you figure out what comes next in a pattern? (Relate to machine learning)

Real-World AI Scenarios

- Students can discuss how machine learning is used in search results, spam filters, voice recognition, etc. Example: How does a spam filter know which emails are junk?

Auto-Complete Story

- Students can use an auto-complete text function to write a short story. Discussion: How does the computer know what words to suggest?

Fair or Unfair? Scenarios

- Students can discuss scenarios where AI might make unfair decisions due to data bias (e.g., a facial recognition system that doesn't work well on certain skin tones).

Code Modification

- Students are given a simple Code.org project and asked to add or delete code to change its behaviour.

Riddles

1. I learn from examples; like a student in school, I find the hidden rules to make my tools cool. What am I?

   Answer: Machine learning

2. I am a repeated sequence that can be found everywhere, in numbers, shapes or letters; I help computers be aware. What am I?

   Answer: Pattern

3. I am the place where you build your maps, with sprites and code, I help you fill the gaps.

   Answer: Code.org Sprite Lab

4. I help you move your guide across the map's wide space with keys or clicks, and I help you keep pace.

   Answer: Map interaction

5. I help cars drive without a driver; I see and think like a human survivor. What am I?
   Answer: Self-driving car
6. I answer your questions in a chat, like a digital friend; I'm always there until the very end.
   Answer: Chatbot
7. I am when a computer 'prefers' one thing over another, I make things unfair. What am I?
   Answer: Data bias

Application-Based Scenario

1. How can you use code to make your guide in Sprite Lab move to a specific location on the map?
2. What are some ways AI can make maps and navigation more helpful?
3. How can we teach an AI bot to recognise patterns without being unfair to anyone?
4. What are some limitations of machine learning? Can a computer learn everything?
5. Why is it important to give a computer lots of different examples (training data) when teaching it to recognise something?

Answer for Exercise

6. Choose the correct answer:

a. Executes an ordered set of instructions
b. Data bias
c. Sports scores
d. Move a sprite and interact with map elements
e. Play area
f. Create the sprite at a set location and moves it using arrow keys

7. Answer the following questions.

a. Here are some differences between human intelligence and computer intelligence:
   - Humans can feel emotions: Computers don't have feelings like happiness or sadness.
   - Humans can be creative: We can imagine new things and make art, while computers follow rules.
   - Humans can learn from experience: We improve at things by trying, while computers require extensive data to learn.

b. The answers may vary because the students should be encouraged to write in their own words. Here is a sample: Machine learning is similar to teaching a computer to learn by showing it numerous examples. If you show it many pictures of cats, it will learn to recognise cats in new pictures. It's like teaching a dog tricks with treats.

c. The answers may vary because the students should be encouraged to write in their own words. Here is a sample: AI systems look at what you like. If you watch many cartoons, it will suggest more cartoons. If you buy many books about dinosaurs, it will mean more dinosaur books. It's like a friend who knows what you like and gives you good ideas.

d. Google Maps is interactive because you can:

- Zoom in and out to see things closer or farther away.
- Drag the map to move around.
- Search for places and get directions.
- See pictures of places.
- Use Street View to see what places look like from the street.

e. The answers may vary because the students should be encouraged to write in their own words. Here's an example: 'When the green flag is clicked, make the sprite say Hello!' The Event block is 'when the green flag is clicked,' and it makes something happen when you click the flag.