

CODEPILOT



Ver. 5.0

7



TEACHER'S MANUAL

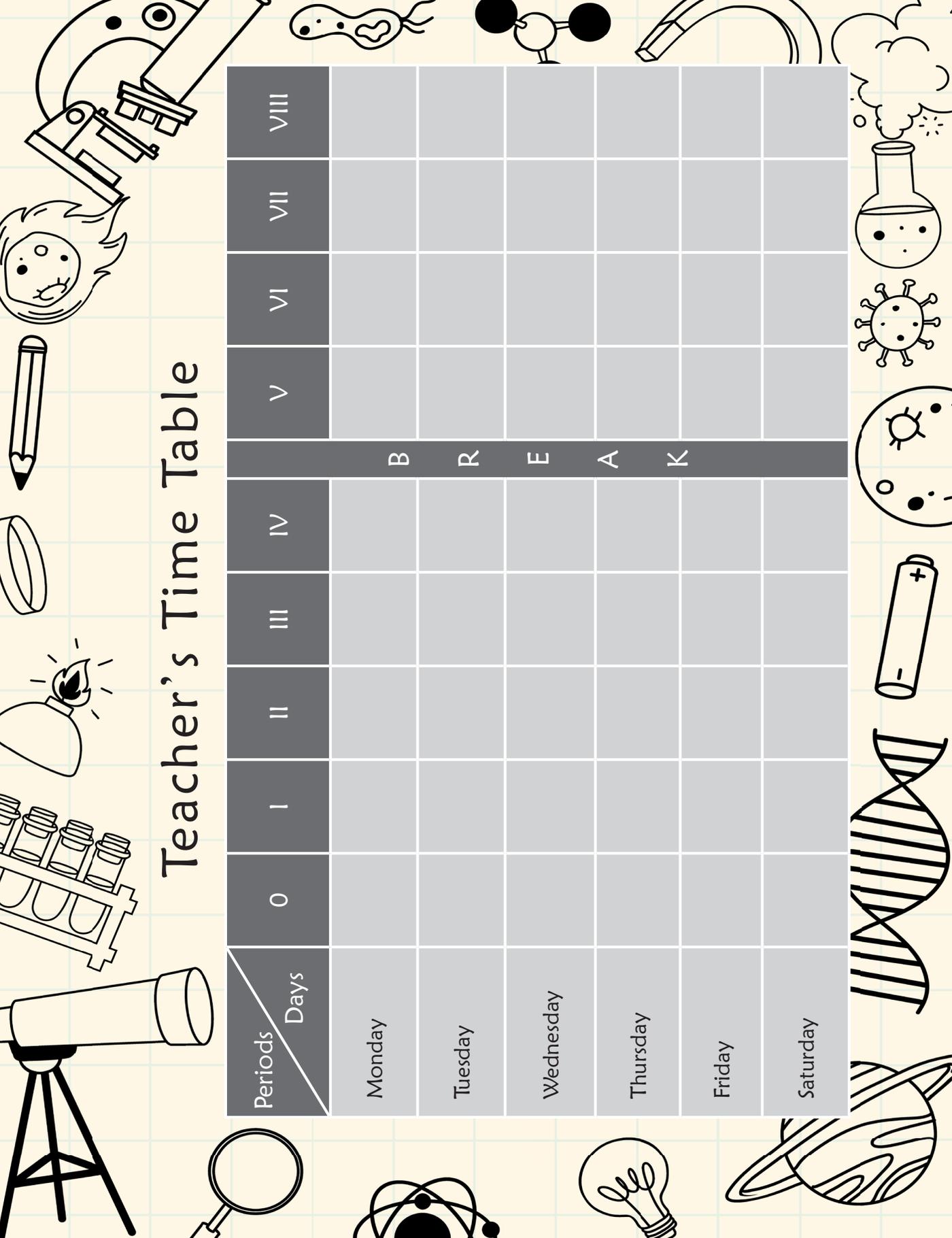
Extended Support for Teachers



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Teacher's Time Table

Periods \ Days	0	I	II	III	IV	B R E A K					V	VI	VII	VIII
Monday														
Tuesday														
Wednesday														
Thursday														
Friday														
Saturday														



DEVELOPMENT MILESTONES IN A CHILD

Development milestones are a set of functional skills or age-specific tasks that most children can do at a certain age. These milestones help the teacher identify and understand how children differ in different age groups.



Age
5 - 8 Years

Physical

- First permanent tooth erupts
- Shows mature throwing and catching patterns
- Writing is now smaller and more readable
- Drawings are now more detailed organised and have a sense of depth

Cognitive

- Attention continues to improve, becomes more selective and adaptable
- Recall, scripted memory and auto-biographical memory improves
- Counts on and counts down, engaging in simple addition and subtraction
- Thoughts are now more logical

Language

- Vocabulary reaches about 10,000 words
- Vocabulary increases rapidly throughout middle childhood

Emotional/ Social

- Ability to predict and interpret emotional reactions of others enhances
- Relies more on language to express empathy
- Self-conscious emotions of pride and guilt are governed by personal responsibility
- Attends to facial and situational cues in interpreting another's feelings
- Peer interaction is now more prosocial and physical aggression declines

“ If you cannot do great things, do small things in a great way. ”

Age
9 - 11 Years

Physical

- Motor skills develop resulting in enhanced reflexes

Cognitive

- Applies several memory strategies at once
- Cognitive self-regulation is now improved

Language

- Ability to use complex grammatical constructions enhances
- Conversational strategies are now more refined

Emotional/ Social

- Self-esteem tends to rise
- Peer groups emerge

Age
11 - 20 Years

Physical

- If a girl, reaches peak of growth spurt
- If a girl, motor performance gradually increases and then levels off
- If a boy, reaches peak and then completes growth spurt
- If a boy, motor performance increases dramatically

Cognitive

- Is now more self-conscious and self-focused
- Becomes a better everyday planner and decision maker

Emotional/ Social

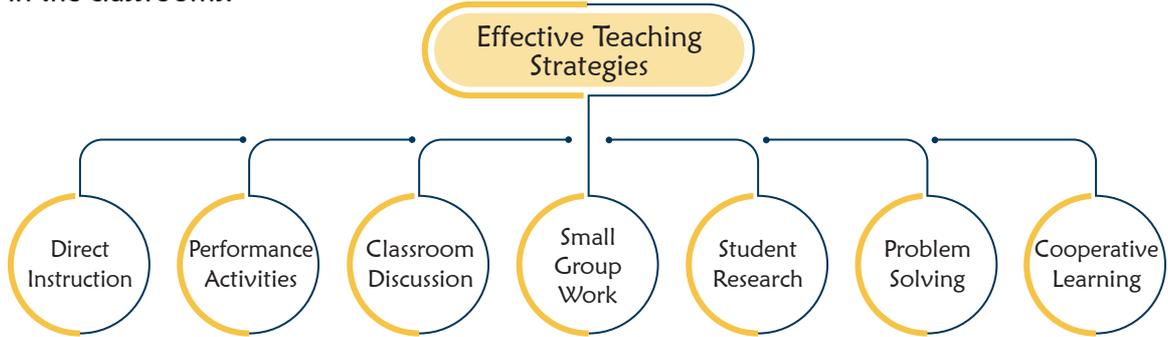
- May show increased gender stereotyping of attitudes and behaviour
- May have a conventional moral orientation

Managing the children's learning needs according to their developmental milestones is the key to a successful teaching-learning transaction in the classroom.

“ Family is the most important thing in the world. ”

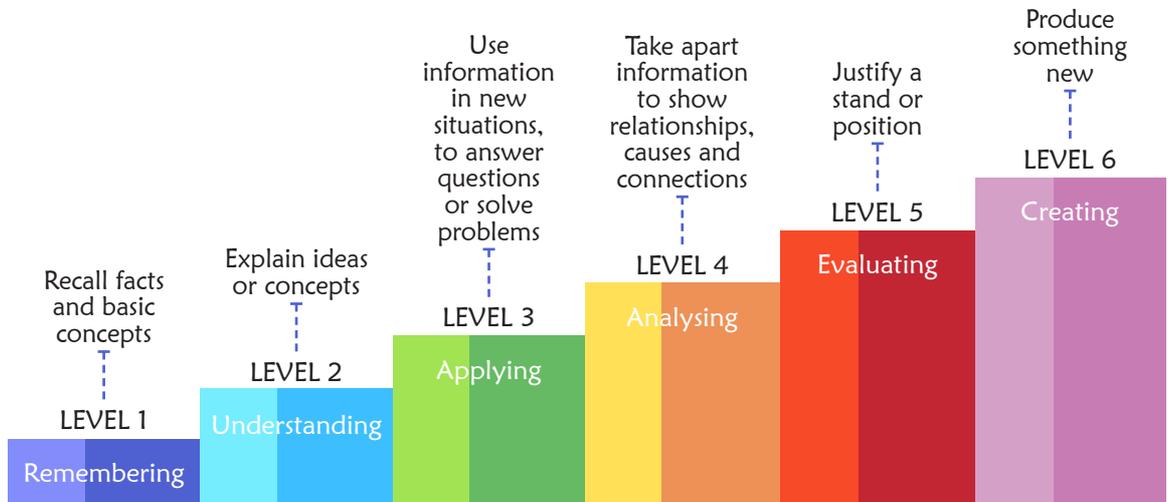
Teaching Strategies

Numerous strategies have evolved over the years to facilitate the teaching-learning process in the classrooms.



Bloom's Taxonomy

Bloom's Taxonomy was created by Dr Benjamin Bloom and several of his colleagues, to promote higher forms of thinking in education instead of rote learning. There are three domains of learning: cognitive (mental), affective (emotional) and psychomotor (physical). However, when we refer to Bloom's Taxonomy we speak of the cognitive domain. Bloom's Taxonomy is a list of cognitive skills that is used by teachers to determine the level of thinking their students have achieved. As a teacher, one should attempt to move students up the taxonomy as they progress in their knowledge.



Teachers should focus on helping students to remember information before expecting them to understand it, helping them understand it before expecting them to apply it to a new situation and so on.

“ If you have no confidence in self, you are twice defeated in the race of life. ”

1 Emerging Trends

Teaching Objectives

Students will learn about:

- ✦ Internet of Things (IoT)
- ✦ Robotic Process Automation (RPA)
- ✦ Virtual Reality (VR)
- ✦ Blockchain Technology
- ✦ 3D Printing
- ✦ 5G Technology
- ✦ Robotics
- ✦ Augmented Reality (AR)
- ✦ Mixed Reality (MR)
- ✦ Bioinformatics
- ✦ Cloud Computing
- ✦ Quantum Computing

Number of Periods

Theory	Practical
3	1

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **8** of the main course book.

Start by introducing the concept of emerging technologies and how they are transforming various fields such as healthcare, education and entertainment.

Discuss how technologies like AI, Machine Learning, IoT and Blockchain are changing the way industries operate.

Explain the concept of IoT and how it allows everyday objects to communicate over the internet.

Introduce the field of Robotics and its applications in manufacturing, healthcare and even space exploration.

Explain the concept of RPA and how it automates repetitive tasks to improve business efficiency.

Define and explain the differences between AR and VR.

Discuss how AR enhances the real world by overlaying digital information and how VR creates immersive experiences.

Explain the concept of blockchain and how it is used to securely store and transfer data.

Discuss how blockchain is used in cryptocurrencies and its potential in industries like supply chain management and voting systems.

Introduce the basics of quantum computing and how it uses qubits to solve complex problems faster than classical computers.

Discuss the future potential of quantum computing in fields like encryption, medicine and environmental science.

Learn the concepts of Blockchain, Bioinformatics and 3D Printing and their impact on various sectors.

Understand the concept of cloud computing and learn the benefits of cloud computing, such as scalability, cost-efficiency and data storage.

Understand the concept of 5G technology and how it differs from previous mobile networks.

Explore the concept of quantum computing.

Extension

Ask the students some questions based on this chapter:

- Q. What are some examples of IoT devices in your life?
- Q. How do robots improve efficiency in industries?
- Q. What is the difference between Augmented Reality (AR) and Virtual Reality (VR)?
- Q. How does Blockchain ensure the security and integrity of data?
- Q. What is Quantum Computing and how could it change the future of technology?
- Q. How can you use RPA to improve business operations?
- Q. In which fields can AI and Machine Learning be used and how do they benefit industries?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **15**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **10** and **15**.

Encourage the students to complete tasks like **ART INTEGRATION ACTIVITY** and **EXPERIENTIAL LEARNING** given on pages **9** and **12**.

Motivate the students to complete activities such as **LIVE LEARNING** on page **15**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **17** to **19** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **19** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **19** in the main course book. This will enhance the ability of the students and serve as a technology literacy activity.

Suggested Activity

Have students explore and perform tasks using cloud-based tools like Google Drive or Dropbox. They will upload and share files to understand how cloud computing works.

Discuss the role of cloud computing in collaborative work and data storage.

2 Number Systems

Teaching Objectives

Students will learn about:

- ✦ Decimal Number System
- ✦ Binary Number System
- ✦ Octal Number System
- ✦ Hexadecimal Number System
- ✦ Conversion of Number Systems
- ✦ Binary Arithmetic Operations

Teaching Plan

Number of Periods	
Theory	Practical
3	1

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **21** of the main course book.

Begin by introducing the concept of number systems and how they are used to represent numbers in different bases. Discuss the importance of understanding number systems in computing.

Explain the difference between the decimal system, which humans use and the binary system, which computers use.

Explain the Decimal number system as a base-10 system using the digits 0-9.

Discuss the place value of each digit based on powers of 10. Provide examples of how place value works in the decimal system.

Introduce the Binary number system as a base-2 system that uses only 0 and 1.

Discuss how each binary digit represents a power of 2.

Explain the Octal number system as a base-8 system using the digits 0-7 and how it relates to the binary system.

Introduce the Hexadecimal system as a base-16 system using digits 0-9 and letters A-F.

Show examples and real-life applications where octal and hexadecimal systems are used.

Discuss the steps involved in converting numbers between different systems: Binary to Decimal, Decimal to Binary, Binary to Octal, Decimal to Hexadecimal, etc.

Introduce basic binary arithmetic operations such as binary addition, subtraction, multiplication and division.

Explain how these operations work by using truth tables and example problems.

Extension

Ask the students some questions based on this chapter:

- Q. How do you convert a binary number to decimal?
- Q. What is the octal number system and why is it used in computing?
- Q. How do you convert decimal numbers to hexadecimal?
- Q. How do you perform binary arithmetic (addition, subtraction, multiplication)?
- Q. What is the significance of the subscript in binary, octal and hexadecimal numbers?
- Q. How can binary arithmetic help in programming and computing tasks?
- Q. What are the advantages of using hexadecimal in programming?
- Q. How does the place value affect the number system's calculations?
- Q. Why is the binary system fundamental for computer operations?
- Q. What are the differences between binary, octal and decimal systems?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **26**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **22** and **29**.

Encourage the students to complete tasks like **EXPERIENTIAL LEARNING** given on page **23**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **30** to **32** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **32** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **32** in the main course book. This will enhance the ability of the students and serve as a **critical thinking** and **technology literacy** activity.

Suggested Activity

Students will solve binary arithmetic problems, such as binary addition and subtraction. They will also practice multiplication and division of binary numbers.

Organize a group discussion where students explore and compare different number systems like binary, decimal, octal and hexadecimal. They will share real-world applications and insights from their research.

Teaching Objectives

Students will learn about:

- ✦ Using Formulas to Perform Calculation
- ✦ Order of Operations
- ✦ Functions and Their Types
- ✦ Sorting Data
- ✦ Conditional Formatting
- ✦ Using Sparklines
- ✦ Operators
- ✦ Cell Referencing in Formulas and its Types
- ✦ Types of Errors
- ✦ Filtering Data
- ✦ Charts in Excel
- ✦ Using Data Validation

Number of Periods	
Theory	Practical
1	3

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **35** of the main course book.

Discuss the power of Excel as a tool for managing and analysing data in various fields like business, education and science.

Introduce the concept of Excel as a powerful tool that helps in calculations, sorting data and creating charts.

Explain the structure of a formula in Excel, starting with an equal sign (=), followed by cell references, operators and constants.

Discuss different operators used in Excel such as arithmetic operators and comparison operators.

Introduce the order of operations (PEMDAS) and explain how it applies to Excel formulas.

Explain relative, absolute and mixed cell references in Excel and how they affect formulas when copied or moved.

Discuss the importance of using absolute references in scenarios where certain values must remain fixed.

Show how to sort data in Excel, both in ascending and descending order and explain custom sorting based on multiple criteria.

Students will sort a dataset of products by price and then by quantity.

Introduce filtering in Excel to view specific information without modifying the original dataset.

Introduce conditional formatting in Excel and how it can automatically apply styles to cells based on their values.

Introduce the different types of charts in Excel, including column charts, bar charts, line charts and pie charts.

Explain how charts help visualize data and make trends easier to understand.

Extension

Ask the students some questions based on this chapter:

- Q. How do formulas and functions help in Excel?
- Q. What are the different types of cell referencing in Excel and how do they affect formulas?
- Q. How can conditional formatting be used to highlight important data in Excel?
- Q. What are the benefits of sorting and filtering data in Excel?
- Q. How can charts in Excel help in data analysis?
- Q. What are the advantages of using Sparklines in Excel for quick data visualization?
- Q. How does Excel help in making data-driven decisions?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **46**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **42** and **49**.

Encourage the students to complete tasks like **EXPERIENTIAL LEARNING** given on page **49**.

Motivate the students to complete activities such as **LIVE LEARNING** on page **45**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **52** and **53** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **54** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **53** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.

Suggested Activity

Create a shopping list in Excel, calculate the total cost for each item and use a bar chart to represent the proportion of total cost for each item.

Divide students into groups and have them apply Excel functions to solve real-life problems, such as creating a budget tracker or analysing sales data.

4

Pictures to Posters with Canva

Teaching Objectives

Students will learn about:

- + Image Editing
- + Importing an Image for Editing

- ✦ Cropping Images
- ✦ Adjusting Image Settings
- ✦ Designing a Poster on Cyber Safety Using a Template
- ✦ Sharing a Design
- ✦ Applying Filters and Effects
- ✦ Adding Text to an Image

Number of Periods	
Theory	Practical
2	1

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **35** of the main course book.

Introduce Canva as an easy-to-use platform for image editing and graphic design.

Explain the importance of editing images for different purposes like creating posters and flyers.

Demonstrate how to upload an image into Canva by clicking on the Upload button and selecting images from the computer.

Show how to crop an image to remove unwanted sections, focusing on adjusting the aspect ratio.

Students will import and crop an image, adjusting it for a specific purpose.

Explain how applying filters can change the tone and style of an image.

Demonstrate how to use shadows, brightness and contrast effects to enhance the image's appearance.

Show how to adjust brightness, contrast and saturation to enhance the image.

Explain how to add text on an image using the Text tab.

Show how to adjust font size, colour and style and explain when to use headings, subheadings and body text.

Introduce the use of templates to create a Cyber Safety poster.

Show how to modify the text, images and elements on a template to match the theme.

Explain how to share their work with others by using the Share button and demonstrate different permission settings.

Discuss privacy settings to ensure their work is shared securely.

Extension

Ask the students some questions based on this chapter:

- Q. What is image editing and why is it important?
- Q. How does cropping an image affect its final design?
- Q. What are the different filters and affects you can apply to an image?
- Q. How do you adjust the brightness and contrast of an image in Canva?



- Q. How can text on an image enhance its message?
- Q. How do you use templates to design posters in Canva?
- Q. What is the purpose of creating a Cyber Safety poster?
- Q. How do you ensure privacy when sharing designs online?
- Q. How can you use Canva to design posters for different events?
- Q. How can you create a visually appealing poster using only text and basic design elements?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **56**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **59** and **63**.

Encourage the students to complete tasks like **ART INTEGRATION ACTIVITY** given on page **63**.

Motivate the students to complete activities such as **LIVE LEARNING** on page **62**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **64** and **65** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **66** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **65** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.

Suggested Activity

Have students design a school event poster (e.g., Annual Day, Sports Day) using Canva.

Encourage students to apply filters, effects and text formatting to create a professional-looking design.

Ask students to share their designs with their peers and receive feedback on their creativity and message.

5

Digital Presence

Teaching Objectives

Students will learn about:

- ✦ What is Digital Citizenship?
- ✦ Building Your Online Persona
- ✦ Threats to Digital Well-being and Online Rules
- ✦ The Impact of Social Media on Self-image and Self-esteem
- ✦ Identifying and Mitigating Cyber Threats

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **68** of the main course book.

Discuss how our online actions shape our identity and how we communicate with others. Highlight the importance of behaving responsibly online just like in real life.

Engage students by asking if they have heard about digital citizenship and how it can affect their online reputation.

Discuss the responsible and ethical use of technology. Explain its importance in ensuring safety, respect and privacy while online.

Explain the Key Areas of Digital Citizenship.

Discuss how everything shared online contributes to your digital footprint and shapes your online persona.

Explain how an online persona is created through the images, posts, comments and messages shared online.

Discuss how building a positive persona can enhance personal and professional opportunities in the future.

Introduce threats like cyberbullying, phishing and identity theft. Discuss how to recognize these threats.

Teach students how to protect their privacy online by using strong passwords, not sharing personal information and recognizing unsafe websites.

Explain the dangers of excessive screen time, cyberbullying and the risks of inappropriate content.

Discuss how social media can build self-expression and confidence but can also lead to unhealthy comparisons and cyberbullying.

Explain Malware, Phishing, Ransomware, Hacking and Spyware with real-world examples.

Discuss how to protect devices from these threats, including antivirus software, strong passwords and privacy settings.

Extension

Ask the students some questions based on this chapter:

- Q. What is digital citizenship and why is it important?
- Q. What are some digital etiquette practices that can help maintain respect online?
- Q. Why is it important to adjust privacy settings on your social media profiles?
- Q. How can malware and phishing harm your personal information?



- Q. How do you build a positive online persona?
- Q. What can happen if you overshare personal details online?
- Q. How does social media affect self-esteem and self-image?
- Q. What are the benefits of strong passwords and two-factor authentication?
- Q. How can cyberbullying negatively affect mental health?
- Q. What steps can you take to stay safe while using the internet and social media?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **70**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **69** and **72**.

Encourage the students to complete tasks like **ART INTEGRATION ACTIVITY** given on page **72**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **74** to **76** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **77** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **76** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.

Suggested Activity

Have students create a PowerPoint presentation on Cyber Threats, showing real-world examples of each threat and how to protect oneself from them.

Encourage students to share their presentations and discuss them with classmates to ensure everyone understands the importance of cybersecurity.

6

Problem Solving Simplified

Teaching Objectives

Students will learn about:

- ✦ Breaking Complex Problems into Manageable Parts
- ✦ Reusing Patterns
- ✦ Using Loops and Conditions in Algorithms
- ✦ Evaluation

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **82** of the main course book.

Introduce computational thinking, which involves breaking down complex problems and solving them step by step.

Discuss how to break big problems into smaller tasks.

Explain how creating a **3D printed necklace** can be broken down into smaller tasks: design the necklace, select materials, print parts, assemble parts, finish the necklace.

Explain how identifying patterns in tasks makes solving problems faster and easier. Discuss how **reusing patterns** saves time and effort.

Show how using an **Excel formula** to calculate marks for multiple students is a repeated pattern.

Discuss how loops are used to repeat tasks multiple times in programming, saving time and effort.

Introduce **If-Then-Else** conditions, where the program makes decisions based on true/false conditions.

Explain a simple program that checks whether a number is positive or negative.

Explain that evaluation is testing different solutions and comparing them based on **efficiency**, **accuracy** and **smartness**.

Compare manual calculation with an **Excel formula** for calculating total scores. Discuss which method is faster, more accurate and easier to use.

Extension

Ask the students some questions based on this chapter:

- Q. What is problem decomposition and how does it help in solving complex problems?
- Q. How does pattern recognition make tasks easier and faster?
- Q. How can you use loops in a program to reduce repetitive tasks?
- Q. What is the If-Then-Else condition and how does it help in decision-making?
- Q. How does evaluation help in choosing the best solution?
- Q. What is the main advantage of using Excel formulas over manual calculations?
- Q. How can you create a number-guessing game using loops and conditions?
- Q. What is the difference between efficiency and accuracy when evaluating a solution?
- Q. Why is it important to break a task into smaller steps, like in problem decomposition?
- Q. How can loops and conditions work together in solving complex tasks?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **87**.

Ask the students to complete the elements like **RAPID RECALL** given on page **87**.

Encourage the students to complete tasks like **EXPERIENTIAL LEARNING** given on page **84**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **87** to **89** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **90** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **89** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.

Suggested Activity

Have students design a simple **Tinkercad project** by creating a 3D model using **pattern recognition** and **decomposition**.

Encourage students to create a **problem-solving algorithm** for everyday tasks (e.g., making a cup of tea or organizing school materials).

7

Making Web Pages Alive

Teaching Objectives

Students will learn about:

- + Hyperlinks in HTML
- + Inserting Images in HTML
- + Adding Audio and Video

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **92** of the main course book.

Explain that hyperlinks allow users to navigate between different web pages or to external sites.

Discuss how hyperlinks are created using the `<A>` tag in HTML.

Engage students: Ask if they have ever used links to navigate between different pages on the internet. Mention popular websites they visit and how links help them jump between different sections.

Introduce the anchor tag `<A>` and explain its attributes like `HREF` (for URL) and `TARGET` (for opening links in new windows or current windows).

Number of Periods	
Theory	Practical
2	1

Types of Hyperlinks: Explain the difference between internal and external links, as well as their use cases in web design.

The Tag: Explain how images are inserted in HTML using the tag. Discuss important attributes like SRC (source of the image) and ALT (alternative text for accessibility).

Styling Images with CSS: Demonstrate how CSS can be used to style images, such as adjusting width, height and applying borders or shadows.

The <AUDIO> and <VIDEO> Tags: Introduce the <AUDIO> and <VIDEO> tags used to embed audio and video files in web pages.

Show how to insert an audio file with the <AUDIO> tag and a video file with the <VIDEO> tag.

Explain how CSS pseudo-classes like :LINK, :VISITED, :HOVER and :ACTIVE can be used to style links depending on their state.

Show how to change the colour of links when they are hovered over, clicked or visited.

Explain how to use hyperlinks as clickable buttons by applying CSS styles like background colour and padding.

Extension

Ask the students some questions based on this chapter:

- Q. What is a hyperlink and how is it used in HTML?
- Q. What are the two types of hyperlinks in HTML and how are they different?
- Q. How do you insert an image into an HTML page using the tag?
- Q. What are the attributes used with the tag and why are they important?
- Q. How can CSS be used to style images in HTML?
- Q. What are the key attributes used with the <AUDIO> and <VIDEO> tags?
- Q. How does the :HOVER pseudo-class work in CSS?
- Q. How can you use an image as a hyperlink?
- Q. What is the difference between the <AUDIO> and <VIDEO> tags in HTML?
- Q. Why is the ALT attribute used with images?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **104**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **99** and **104**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page **101**.

Motivate the students to complete activities such as **LIVE LEARNING** on page **104**.



After explaining the chapter, let the students do the **LEARNING LOGS** on pages **87** to **107** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **108** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **107** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.

Suggested Activity

Have students design a personal webpage with sections for a biography, hobbies and contact details. They should insert images, link to external websites and embed audio or video content to make their webpage more interactive.

8 Lists and Tables in HTML5

Teaching Objectives

Students will learn about:

- ✦ Inserting Lists in HTML5
- ✦ Using CSS with Lists
- ✦ List Styling with Colours
- ✦ Tables in HTML
- ✦ CSS Properties Used with the <TABLE> Tag

Number of Periods	
Theory	Practical
1	3

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **110** of the main course book.

Discuss the importance of presenting data systematically and how lists and tables help in organizing content on web pages.

Ask students if they have seen lists or tables on websites, such as product lists, schedules or menu cards.

Explain the three types of lists in HTML5: Ordered lists (), Unordered lists () and Definition lists (<DL>).

Ordered List: Discuss how ordered lists are used for items that need to follow a specific order.

Demonstrate how to create an ordered list for a recipe or set of instructions.

Explain how unordered lists are used for bullet points or items that don't need to follow an order. Show how to list items like fruits or vegetables.

Have students create both an ordered and unordered list on their HTML page.

Introduce description lists and explain how they show terms and definitions.

Show how to create a list of terms and their definitions, such as **HTML** and **Web Design**.

Explain how CSS can be used to change list markers, such as bullets, numbers or custom images.

Show how to style an unordered list with square bullets or an ordered list with Roman numerals.

Discuss the list-style-type, list-style-position and list-style-image properties for styling lists.

Activity: Students will create a styled list using custom markers and change its appearance using CSS.

Introduce the <TABLE> tag and explain the components of a table: rows (<TR>), headers (<TH>) and cells (<TD>).

Explain the use of table headings (<TH>) and captions (<CAPTION>).

Demonstrate how CSS can be applied to style tables, including using the BORDER, BORDER-COLLAPSE and BORDER-SPACING properties.

Students will create a table to display student names, grades and subjects using the appropriate HTML tags and style it with CSS.

Discuss how to style the borders of a table using BORDER, BORDER-WIDTH, BORDER-STYLE and BORDER-COLOR.

Explain how to adjust the width of a table and add padding to cells for better readability. integrity.

Extension

Ask the students some questions based on this chapter:

- Q. What are the three types of lists in HTML and when would you use each?
- Q. How can CSS be used to style an unordered list in HTML?
- Q. How does a definition list differ from an ordered and unordered list in HTML?
- Q. What are the key components of an HTML table?
- Q. How do you apply borders and padding to an HTML table using CSS?
- Q. What is the purpose of using the <TH> tag in a table?
- Q. What CSS properties are used to change the style of a table's borders?
- Q. How do you create a table caption in HTML?
- Q. What is the significance of the BORDER-COLLAPSE property in CSS for tables?
- Q. How can you customize the list markers in an ordered or unordered list using CSS?



Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **125**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **118** and **126**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page **113**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **128** and **129** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **130** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **130** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.

Suggested Activity

Have students create a class timetable using an HTML table, applying CSS properties to style the borders, background and text.

Encourage students to add custom list markers for a personal task list or a collection of their favourite books using ordered and unordered lists.

9

Flow of Control in Python

Teaching Objectives

Students will learn about:

- ★ Python Statements - Flow of Control
- ★ Ternary Operator in Python
- ★ The Infinite Loop
- ★ Some More Programs
- ★ Python Selection Statements (if, else, elif)
- ★ Python Iterative Statements
- ★ Jump Statements (break, continue)

Number of Periods	
Theory	Practical
3	1

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **133** of the main course book.

Discuss how the order in which program statements are executed is known as the flow of control. Explain the three types of flow: Sequential, Selective and Iterative.

Ask students how they make decisions in daily life, like What should I eat today? and relate it to how computers make decisions using if statements.

Introduce the if statement for decision-making in Python. Explain that Python evaluates conditions and executes certain actions based on the result of the condition.

Demonstrate the if statement with a simple program to check if the user is eligible to vote based on age.

If...Else Statement: Explain the if...else statement for making a choice between two options.

Show how Python allows you to perform conditional checks and assign values or execute expressions in a single line using the ternary operator.

Discuss the for loop to repeat a block of code a fixed number of times, iterating over a sequence or range.

While Loop: Introduce the while loop, which repeats a block of code as long as a condition is true.

Discuss what an infinite loop is, why it happens and how it can be avoided.

Demonstrate an infinite loop where the condition never becomes false, causing the program to run indefinitely.

Introduce the break statement, which stops the loop prematurely.

Show how to use the break statement to stop a loop if a user enters an odd number.

Discuss the continue statement, which skips the current iteration and moves to the next one.

Extension

Ask the students some questions based on this chapter:

- Q. What is flow of control and why is it important in programming?
- Q. How does the if statement help a computer make decisions?
- Q. What is the difference between if and if...else statements?
- Q. How does the ternary operator simplify conditional statements?
- Q. How does the for loop differ from the while loop in Python?
- Q. What is an infinite loop and why is it problematic?
- Q. What is the function of the break statement in a loop?
- Q. How does the continue statement work within a loop?
- Q. What are the benefits of using loops in programming?
- Q. How can nested if statements help in solving complex conditions?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **144**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **138** and **142**.

Encourage the students to complete tasks like **EXPERIENTIAL LEARNING** given on page **138**.

Motivate the students to complete activities such as **LIVE LEARNING** on page **135**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **147** and **148** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **140** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **149** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.

Suggested Activity

Have students create a Discount Calculator program where the discount percentage changes based on the amount spent. Use if-else statements to apply the correct discount and display the final price. Encourage students to use nested if statements to categorize ages into Child, Teen, Adult and Senior categories based on input.

10 Domains of AI

Teaching Objectives

Students will learn about:

- ✦ What are AI Domains?
- ✦ Data Science
- ✦ Natural Language Processing (NLP)
- ✦ Computer Vision

Number of Periods	
Theory	Practical
2	1

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **151** of the main course book.

Explain Artificial Intelligence (AI) as the field that enables machines to perform tasks like humans, such as speaking, thinking and problem-solving.

Discuss AI applications in daily life, like chatbots, voice assistants and recommendation systems.

Introduce AI domains as specific fields where AI techniques are applied to solve particular types of problems. Examples include Data Science, Natural Language Processing and Computer Vision.

Discuss each AI domain with simple examples, e.g., how Google Translate uses AI to translate languages or how voice assistants like Siri and Alexa use AI for processing speech.

Define data science as the study of data that helps us gather organize and analyze information to make informed decisions.

Explain how data science helps with activities like tracking fitness steps or predicting future trends. Discuss real-life applications such as in healthcare, finance, retail, e-commerce and entertainment. Explain Natural Language Processing (NLP) as a field that helps machines understand and interpret human language.

Discuss chatbots, voice assistants and grammar checkers as applications of NLP.

Introduce computer vision as the AI domain that enables machines to “see” and understand images and videos, similar to human vision.

Discuss how computer vision is used in face recognition, image search, medical imaging and autonomous vehicles.

Extension

Ask the students some questions based on this chapter:

- Q. What is AI and how does it help machines perform tasks like humans?
- Q. What are the three main domains of AI discussed in the chapter?
- Q. How does data science help us make decisions in daily life?
- Q. What role does Natural Language Processing (NLP) play in chatbots and voice assistants?
- Q. How does computer vision help machines understand the world around them?
- Q. In what ways can AI be used to improve healthcare?
- Q. How does data science impact e-commerce and entertainment industries?
- Q. Why is natural language processing important for translation tools like Google Translate?
- Q. How does computer vision make autonomous vehicles smarter?
- Q. How does AI improve online shopping experiences through recommendation systems?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **153**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **153** and **155**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page **155**.

Motivate the students to complete activities such as **LIVE LEARNING** on page **153**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **156** and **157** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **159** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **158** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.



Suggested Activity

PowerPoint Presentation: Ask students to create a PowerPoint presentation on the three main AI domains.

Research examples of each domain in real-life applications such as in healthcare, e-commerce and entertainment.

Discuss how AI could evolve in the future and provide suggestions on how these domains can be used in new ways.

11 Designing Circuits with Tinkercad

Teaching Objectives

Students will learn about:

- ✦ What is a Circuit?
- ✦ Building Basic Circuits
- ✦ Designing a Light with a Switch
- ✦ Creating a Smart Lamp with Arduino
- ✦ Tinkercad Circuits and its Interface
- ✦ Designing a Series Circuit
- ✦ Using Arduino in Tinkercad

Number of Periods	
Theory	Practical
2	3

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **161** of the main course book.

Explain that a circuit is a path that allows electricity to flow and it's the backbone of all electronic devices.

Discuss how circuits are used in devices like flashlights, televisions and smartphones. Ask students if they have seen circuits in action and where they have used them.

Introduce the concept of a series circuit where components are connected in a single path and if one component fails, the whole circuit is interrupted.

Explain the concept of a parallel circuit where each component has its own path and failure of one component does not affect others.

Explain the Tinkercad circuit interface, where students can design and simulate their circuits.

Discuss the component library, workspace and tools available in Tinkercad for building circuits.

Show how to connect an LED, resistor, battery and breadboard to create a basic circuit.

Teach students how to create a series circuit with two LEDs, a resistor and a 9V battery.

Introduce the concept of a light with a switch and show how to create a circuit that turns on and off based on the switch's position.

Students will build a circuit using a 9V battery, switch and light bulb and test it on Tinkercad.

Explain the role of Arduino as a microcontroller that controls electronic devices. Discuss its components and how it interacts with sensors, lights and motors.

Show students how to use Arduino Uno to control a basic circuit in Tinkercad.

Students will learn to write simple Arduino code in Tinkercad to control LEDs using the Arduino IDE.

Demonstrate how to create a smart lamp that turns on or off based on the amount of light detected by a photoresistor.

Guide students through connecting the components, coding in Tinkercad and simulating the smart lamp circuit.

Extension

Ask the students some questions based on this chapter:

- Q. What is a circuit and how does it work?
- Q. Explain the difference between a series circuit and a parallel circuit.
- Q. What components are necessary to create a basic circuit in Tinkercad?
- Q. How does a breadboard help in creating circuits?
- Q. What happens when one component in a series circuit stops working?
- Q. What is the role of the resistor in a circuit?
- Q. How does the switch control the flow of electricity in a circuit?
- Q. What is the function of Arduino in electronic projects?
- Q. How does a photoresistor help in making a smart lamp?
- Q. What is the difference between Arduino Uno and Arduino Nano?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **153**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **153** and **155**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page **155**.

Motivate the students to complete activities such as **LIVE LEARNING** on page **153**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **156** to **158** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **159** in the main course book.

Take the students to the computer lab and let them practice the activity given in the **LAB LEARNING** section on page **158** in the main course book. This will enhance the ability of the students and serve as a **technology literacy** activity.



Suggested Activity

Students will create a traffic light system in Tinkercad by connecting three LEDs (Green, Yellow, Red) to an Arduino Uno and programming them to simulate the sequence of traffic lights.

Students will program the traffic light system to control the timing of each light using the delay function.