C<>DEPILOT

Ver. 5.0

8

TEACHER'S MANUAL
Extended Support for Teachers

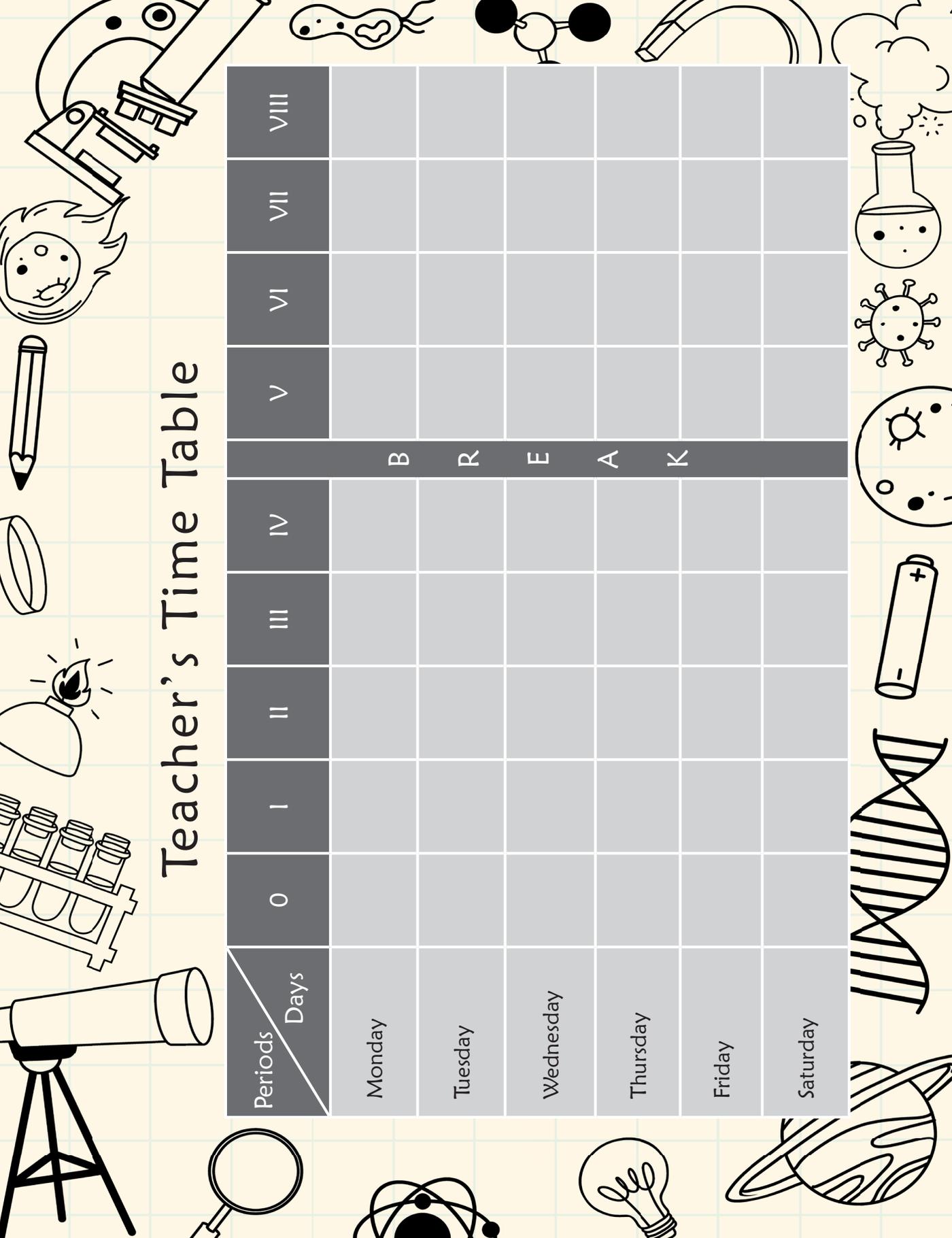**ORANGE**
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Teacher's Time Table

Periods / Days	0	I	II	III	IV		V	VI	VII	VIII
Monday										
Tuesday										
Wednesday					B R E A K					
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
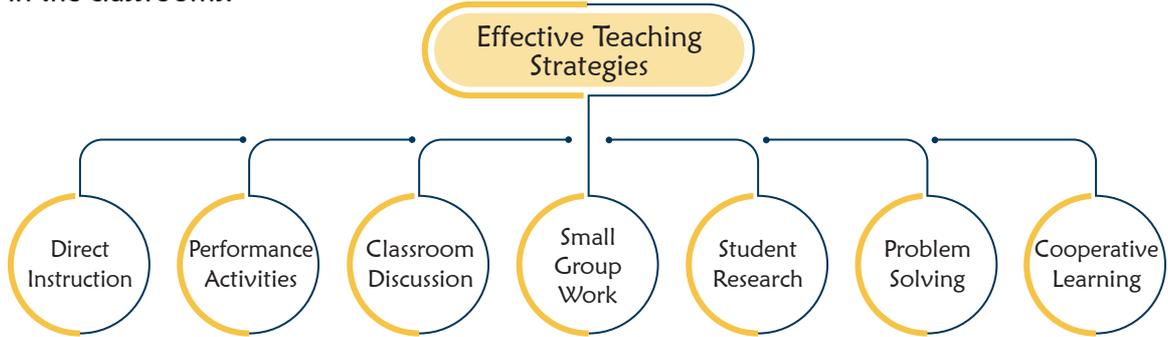
Emotional/ Social
- May show increased gender stereotyping of attitudes and behaviour
- May have a conventional moral orientation

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

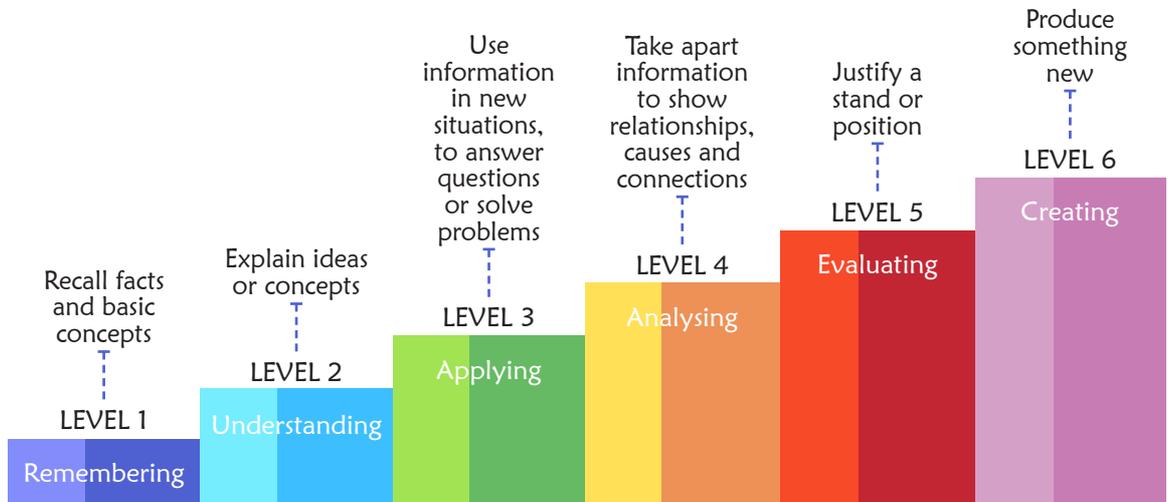" Family is the most important thing in the world. "

Teaching Pedagogies

Pedagogy is often described as the approach to teaching. It is the study of teaching methods including the aims of education and the ways in which such goals can be achieved.

Lesson Plans

A lesson plan is the instructor's road map which specifies what students need to learn and how it can be done effectively during the class time. A lesson plan helps teachers in the classroom by providing a detailed outline to follow in each class.

A lesson plan addresses and integrates three key components:

+ Learning objectives
+ Learning activities
+ Assessment to check the student's understanding

A lesson plan provides an outline of the teaching goals:

Before the class

1. Identify the learning objectives.
2. Plan the lesson in an engaging and meaningful manner.
3. Plan to assess student's understanding.
4. Plan for a lesson closure.

During the class

Present the lesson plan.

After the class

Reflect on what worked well and why. If needed, revise the lesson plan.

" Knowing yourself is the beginning of all wisdom. "

Teaching Strategies

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

Effective Teaching Strategies

- Direct Instruction
- Performance Activities
- Classroom Discussion
- Small Group Work
- Student Research
- Problem Solving
- Cooperative Learning

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.

Recall facts and basic concepts
LEVEL 1
Remembering

Explain ideas or concepts
LEVEL 2
Understanding

Use information in new situations, to answer questions or solve problems
LEVEL 3
Applying

Take apart information to show relationships, causes and connections
LEVEL 4
Analysing

Justify a stand or position
LEVEL 5
Evaluating

Produce something new
LEVEL 6
Creating

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 Networks Around Us

Teaching Objectives

Students will learn about::

✦ Computer Networks
✦ Network Devices
✦ Data Communication System
✦ Network Protocols
✦ Types of Computer Networks
✦ Network Topologies
✦ Transmission Media

Number of Periods	
Theory	Practical
3	**0**

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.

Explain that a network is a system of interconnected nodes that exchange information resources or services. Clarify that networks exist not only in computers but also in social systems and transportation systems.

Introduce computer networks as a group of computers and devices connected to share data resources and internet access. Explain how computer networks make communication faster and easier. Mention that the first computer network was developed in the 1960s.

Discuss the advantages of computer networks such as sharing data software and hardware devices reducing costs and enabling faster communication.

Explain important networking terminologies including client server internet intranet URL ISP IP address DNS and network bandwidth. Use simple examples such as websites email and online classes to help students understand.

Introduce network devices such as network interface card, modem, hub, switch, router, repeater, gateway and bridge. Explain the function of each device using classroom or school lab examples.

Explain the data communication system and its five components message sender receiver transmission medium and protocol. Use the diagram given in the chapter to explain how data moves from sender to receiver.

Introduce network protocols and explain their role in communication. Explain TCP/IP, HTTP/HTTPS FTP and SMTP in simple terms with real-life uses such as websites file transfer and emails.

Discuss types of computer networks based on size such as LAN, MAN, WAN, PAN and CAN. Explain their uses advantages and limitations with examples like home, school, city and personal devices.

Explain network architecture by introducing Peer-to-Peer and Client-Server networks. Compare both architectures using examples like sharing files between friends and accessing data from a central server.

Introduce network topologies such as Bus, Star, Ring, Mesh, Tree and Hybrid. Explain how devices are connected in each topology and discuss their advantages and disadvantages using diagrams from the chapter.

Explain transmission media as the path through which data travels. Discuss guided media like twisted pair cable, coaxial cable and fibre optic cable and unguided media like radio waves, microwaves and infrared waves with examples such as Wi-Fi, TV, remotes and mobile communication.

Extension

Ask the students some questions based on this chapter:

Q. What is a network?

Q. What is the role of the modem in a network?

Q. Name the main components of a data communication system.

Q. What is the role of a router in a network?

Q. Differentiate between HTTP and HTTPS.

Q. Which topology is used in a small office setting?

Q. What does Wi-Fi allow us to do in a network?

Q. What happens if a router stops working in a network?

Q. What is the purpose of an IP address in a network?

Q. What is a hub used for in a network?

Q. Why is it important to keep your passwords safe in a network?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **12**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **14** and **18**.

Encourage the students to complete tasks like **EXPERIENTIAL LEARNING** given on page **9** and **ART INTEGRATION LEARNING** given on page **14** in the computer lab.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **19** and **20** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **21** 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 **20** in the main course book. This will enhance the ability of the students and serve as **critical thinking** and **technology literacy** activity.

Suggested Activity

Ask students to draw a simple network diagram showing computers printers and smartphones connected together.

Encourage them to explain which devices and topology are used and why.

2 Smart Learning with Google Apps

Teaching Objectives

Students will learn about::

+ Google Apps
+ Google Docs
+ Google Sheets
+ Google Drawings
+ Google Drive
+ Google Slides
+ Google Forms
+ Other Google Apps

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 **23** of the main course book.

Begin by discussing the evolution of software tools and the shift from local disk-based tools to cloud-based applications like Google Apps.

Show the image of Google Apps and ask students what apps they already use. Discuss the importance of cloud computing in modern work and education.

Introduce Google Drive as a cloud storage service and discuss its features. Walk students through accessing Google Drive.

Explain how to create, upload, and organise files in Google Drive.

Discuss Google Docs and the real-time collaboration feature that allows multiple users to work simultaneously on a document. Students will create a document and collaborate with a partner.

Introduce Google Slides as a tool for creating presentations. Explain how to create a new presentation and add elements like text, images, and animations.

Discuss Google Sheets and its capabilities for creating spreadsheets, entering data, and generating charts. Walk students through creating a new Google Sheet.

Show how Google Forms can be used for creating surveys and quizzes. Walk students through creating a Google Form and collecting responses.

Wrap up by asking students how they can apply these tools in their school projects and team activities.

Extension

Ask the students some questions based on this chapter:

Q. How does Google Drive help in collaboration with others?

Q. Why is Google Docs useful for group work or team projects?

Q. Can you explain how Google Slides makes presentations more interactive?

Q. What are some benefits of using Google Sheets over traditional spreadsheets?

Q. How can Google Forms help in collecting feedback or data for school projects?

Q. How does Google Drive keep your files safe, and what does the "Bin" feature do?

Q. In what ways can Google Meet be used for online learning or virtual meetings?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **31**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **35** and **37**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on pages **26** and **29** in the computer lab.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **38** to **40** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **40** 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 **40** in the main course book. This will enhance the ability of the students and serve as **creativity** and **technology literacy** activity.

Suggested Activity

Ask students to create a family tree using Google Drawings. Students can insert pictures and text for family members and add their birth years.

Encourage students to explore Google Calendar for event scheduling and Google Meet for virtual classes or meetings.

3   Stills to Motion with Canva

Teaching Objectives

Students will learn about::

✦ Video Editing

✦ Adding and Editing Elements

✦ Sharing a Video

Number of Periods	
Theory	Practical
1	2

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **44** of the main course book.

Begin by discussing the importance of videos in the digital world and the role Canva plays in video creation.

Introducing the primary features of Canva's video editing tools. Discuss what types of videos students have seen or created.

Introduce video editing as the process of refining video clips by removing unnecessary parts and adding sound, text, effects, and transitions.

Walk students through the steps of creating a new video in Canva: Click on the Create button, select the Video (Landscape) option, and start editing.

Discuss the importance of the timeline, the play button, and the add page button in the Canva video interface.

Show how to add and edit video clips, trim clips, and adjust their duration to fit the narrative.

Explain how to insert and edit elements like text, stickers, shapes, and transitions. Discuss how these can enhance the creativity of the video.

Discuss the process of adding audio to videos, adjusting audio volume, and using the Fade In and Fade Out effects.

Introduce transitions and animations to make video scenes more engaging. Show how to apply transitions and animations between clips.

Demonstrate how to preview and share a video with others. Discuss various sharing options available in Canva.

Extension

Ask the students some questions based on this chapter;

Q. How can video editing help in making a story more engaging?

Q. What is the role of the timeline in video editing in Canva?

Q. Why do you think transitions are important between video clips?

Q. How does Canva make it easy to add audio to a video?

Q. How would you use text and stickers to make a video more interesting?

Q. Why is it important to trim video clips during editing?

Q. What is the purpose of adding animations to video clips?

Q. How can you use Canva to share a video with others?

Q. What features in Canva would you use to make a video look more professional?

Q. How can transitions and effects help match the mood of a video?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **50**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **47** and **50**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page **49** in the computer lab.

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 **creativity** and **technology literacy** activity.

Suggested Activity

Ask students to create a video showcasing their school or a class event, incorporating text animations, transitions, and background music.

Encourage students to share their completed videos and collaborate with classmates to provide feedback and make improvements.

4 AI, Ethics and Online Awareness

Teaching Objectives

Students will learn about::

✦   Digital Citizenship in the Modern World

✦   Hacking

✦   Facial Recognition Technology

✦   Big Data and Targeted Marketing: A Digital Revolution

✦ Understanding Machine Learning Algorithms

✦ Spotting Fake News in the Digital Era

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 **56** of the main course book.

Begin by discussing what it means to be a good digital citizen and why digital citizenship is important in today's world.

Introducing the concept of AI and ethics, and engage the class in a discussion about their views on online behaviour and digital respect.

Define and explain digital citizenship, highlighting the core values of respect, responsibility, and safety.

Introduce hacking, explaining its types: Black-hat, White-hat, and Grey-hat hacking. Discuss their ethical implications and impact on online safety.

Discuss facial recognition technology and its ethical concerns regarding privacy.

Explain big data and targeted marketing, emphasizing how it influences online behaviour and privacy. Discuss the ethical considerations of using big data for marketing.

Introduce machine learning algorithms, their role in online decision-making, and the implications for digital citizenship.

Discuss the importance of verifying information online and introduce the concept of fake news. Teach students how to spot misinformation and disinformation.

Engage students in critical thinking by discussing the consequences of spreading fake news and how it affects society.

Extension

Ask the students some questions based on this chapter:

Q. What does it mean to be a responsible digital citizen?

Q. How can you ensure your personal information is protected online?

Q. Why is it important to verify information before sharing it on the internet?

Q. What are the different types of hacking and how do they impact online security?

Q. What ethical concerns arise with the use of facial recognition technology?

Q. How can machine learning algorithms influence your online experience?

Q. What is the difference between misinformation and disinformation?

Q. Why is privacy important in the digital world, and how can you protect your digital footprint?

Evaluation

AEncourage the students to complete tasks like **EXPERIENTIAL LEARNING** given on page **57** in the computer lab.

Ask the students to complete the elements like **ASK AI AGENT** given on page **58**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **58** and **60**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **62** and **63** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **64** 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 **63** in the main course book. This will enhance the ability of the students and serve as **Creativity** and **technology literacy** activity.

Suggested Activity

Divide the class into small groups. Each group will discuss one aspect of digital citizenship (e.g., privacy, ethics, responsibility) and present their key points to the class.

Ask students to track their online activities for a week and analyse the data they leave behind, discussing how it affects their digital reputation.

5   Abstraction: The Art of Simplifying

Teaching Objectives

Students will learn about::

✦   Problem Segmentation
✦   Encapsulation
✦   Logic Masking
✦   Abstraction

| Number of Periods ||
Theory	Practical
1	2

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **66** of the main course book.

Start by explaining abstraction as the way of making difficult tasks easier by focusing on the key details.

Introduce the four key concepts of computational thinking covered in this chapter:

1.   Problem segmentation: Breaking a large task into smaller, more manageable parts.

2. Encapsulation: Grouping related information together and hiding unnecessary details.

3. Logic masking: Showing only the necessary information and hiding the complex details.

4. Abstraction: Focusing on the main details and ignoring irrelevant information.

Use the example of creating a Personal ID Card to demonstrate how these concepts work together to simplify complex tasks.

Discuss problem segmentation by explaining how breaking a task into smaller steps makes it easier to complete.

Encapsulation helps keep the process organised by grouping related information together, ensuring that each part works as a self-contained unit.

Introduce logic masking by discussing how hiding unnecessary details, such as sensitive information, makes tasks cleaner and more secure.

Finally, explain abstraction by showing how focusing on essential information simplifies the task and makes it easier to understand.

Extension

Ask the students some oral questions based on this chapter.

Q. What does problem segmentation mean?

Q. How can abstraction help make a task simpler?

Q. What is an example of encapsulation?

Q. Why is logic masking important in a task?

Q. Can you think of a time when you used abstraction?

Q. What is the main purpose of abstraction?

Q. How does encapsulation help in organising information?

Q. Why is it helpful to hide unnecessary details?

Q. How does abstraction help in designing apps or websites?

Q. Can you explain logic masking in simple words?

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 **71** and **72**.

Encourage the students to complete tasks like **EXPERIENTIAL LEARNING** given on page **69** and **ART INTEGRATION LEARNING** given on page **72** in the computer lab.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **73** and **74** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **74** 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 **74** 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

Create a Digital Diwali Card in Canva and note down the steps they took to break the task into smaller parts.

Have students create a Personal ID Card using the steps outlined in the chapter. Discuss how abstraction and segmentation helped simplify the process.

6   Frames and Forms in HTML5

Teaching Objectives

Students will learn about:

✦   Frames in HTML5

✦   Forms in HTML5

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 **79** of the main course book.

Begin by explaining frames in HTML5. Discuss how <IFRAME> is used to embed external content within a page.

Introduce the <IFRAME> tag, and explain its attributes such as SRC, HEIGHT, WIDTH, NAME, and ALLOWFULLSCREEN.

Discuss various uses of <IFRAME>, such as embedding Google Maps, videos, and external web pages.

Ask students to create a webpage that embeds two different web pages using <IFRAME>.

Introduce forms in HTML5. Explain that <FORM> is used to collect data from users.

Discuss the <FORM> tag and its ACTION and METHOD attributes.

Show how to create various input fields using the <INPUT> tag:

- Text fields
- Radio buttons
- Checkboxes
- Password fields
- Submit and Reset buttons

Discuss the use of the <TEXTAREA> tag for multi-line text input and <SELECT> tag for creating drop-down menus.

Introduce <DATALIST> to provide input suggestions while allowing users to enter custom data.

Show how to use CSS to style forms and frames, explaining properties like BORDER, PADDING, MARGIN, and BACKGROUND-COLOR.

Extension

Ask the students some oral questions based on this chapter.

Q. What is the purpose of the <IFRAME> tag in HTML?

Q. How does the <INPUT> tag work, and what are its different types?

Q. What does the ACTION attribute in a form do?

Q. How can you use the <SELECT> tag to create a drop-down list in a form?

Q. What is the difference between a radio button and a checkbox?

Q. How do you use CSS to style a form element?

Q. What is the <TEXTAREA> tag used for in HTML forms?

Q. How can the <DATALIST> tag help in a form?

Q. What is the function of the <LABEL> tag in HTML forms?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **94**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **83** and **95**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page 89.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **96** and **97** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **98** 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 **98** 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

Have students create a digital or hand-drawn diagram of a web page layout using frames and forms.

Encourage them to include elements like <IFRAME>, <INPUT>, <TEXTAREA>, and <SELECT>, and explain their functionality.

7 JavaScript for Beginners

Teaching Objectives

Students will learn about:

+ JavaScript
+ Understanding the <SCRIPT> Tag
+ Output Statement in JavaScript
+ Including HTML Tags in JavaScript
+ JavaScript Popup Boxes

+ Setting Up JavaScript
+ Types of JavaScript
+ Components of a JavaScript Statement
+ Functions in JavaScript
+ Some More Programs

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 **100** of the main course book.

Discuss the importance of JavaScript in modern web development. Explain how JavaScript is used to create interactive elements like buttons, animations, games, and form validation.

Introduce JavaScript's core role in web development, and how it works alongside HTML and CSS to create interactive and dynamic websites.

Introduce the <SCRIPT> tag and explain its function in embedding JavaScript into an HTML document.

Define functions and explain how they help to organise code into reusable blocks.

Show how to define a function using the function keyword and pass parameters.

Discuss function invocation and demonstrate calling a function with arguments.

Introduce three types of JavaScript popup boxes: Alert, Confirm, and Prompt.

Discuss the differences between each and when to use them.

Explain the concept of variables, how to declare them, and the types of values they can store.

Discuss the use of let, var, and const for declaring variables.

Explain the different types of operators: arithmetic, comparison, and logical operators.

Show examples of using operators in JavaScript to perform tasks like addition, subtraction, and comparisons.

Extension

Ask the students some oral questions based on this chapter.

Q. What role does JavaScript play in web development?

Q. How do you use the <SCRIPT> tag to add JavaScript to an HTML page?

Q. Why are functions useful in JavaScript?

Q. What is the difference between internal and external JavaScript?

Q. How do you create an alert box in JavaScript?

Q. How can JavaScript popup boxes enhance user interaction on websites?

Q. What are the differences between the let, var, and const keywords in JavaScript?

Q. What is the purpose of the confirm box in JavaScript?

Q. How does JavaScript handle mathematical operations and user inputs?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **102**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **102** and **110**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page **89**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **96** and **97** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **98** 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 **98** 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

Create a webpage that asks for the user's name, age, and whether they are eligible to vote. Display a message based on the input using JavaScript.

Students will use JavaScript functions and variables to calculate and display the result.

8 MySQL: My First Database

Teaching Objectives

Students will learn about:

- ✦ Data and Information
- ✦ Introduction to Database
- ✦ Database Management System (DBMS)
- ✦ Relational Database Management System (RDBMS)
- ✦ Introduction to SQL
- ✦ MySQL
- ✦ SQL Data Types
- ✦ SQL Operators
- ✦ SQL Constraints
- ✦ Creating, Viewing and Deleting a Database
- ✦ Creating and Managing Tables
- ✦ Inserting Data into Tables

- ✦ Retrieving Data from Table
- ✦ Deleting Records from a Table
- ✦ Updating Records in a Table

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 **122** of the main course book.

Begin by explaining the need for databases in storing and organising large amounts of data. illustrates data and information, and discuss how raw data is processed into useful information.

Introduce the concept of a Database Management System (DBMS) and explain how RDBMS like MySQL is used to manage data efficiently.

Discuss the importance of relational databases and their use of tables, rows, and columns to organise data.

Explain the SHOW DATABASES command to view existing databases and DROP DATABASE to delete databases.

Explain how to create tables within a database using the CREATE TABLE command.

Introduce table components like fields, records, primary keys, and foreign keys.

Show how to insert data into tables using the INSERT INTO command for all columns and specific columns.

Introduce the SELECT command to retrieve data from tables. Explain how to use the WHERE clause to filter data based on specific conditions.

Discuss SQL operators like AND, OR, and NOT for combining conditions in queries.

Introduce SQL constraints such as PRIMARY KEY, FOREIGN KEY, NOT NULL, and DEFAULT to manage data integrity.

Extension

Ask the students some oral questions based on this chapter.

Q. What is the difference between data and information?

Q. What role does MySQL play in data management?

Q. What are the components of a relational database?

Q. How do primary keys and foreign keys establish relationships between tables?

Q. What SQL operators are used to filter data in a table?

Q. What is the importance of SQL constraints in maintaining data integrity?

Q. How would you retrieve all students who have a grade above 80 using SQL?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **137**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **125** and **131**.

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

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **139** and **140** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **141** 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 **140** in the main course book. This will enhance the ability of the students and serve as a creativity and technology literacy activity.

Suggested Activity

Create a database named Hospital and a table Patients with fields like PatientID, Name, Age, Disease, and Doctor.

Students will insert data into the table, retrieve records based on specific conditions, and use SQL constraints to manage the data effectively.

Discuss the use of relational databases in healthcare, finance, and other industries.

9 Step Ahead with Python

Teaching Objectives

Students will learn about:

✦ Functions

✦ Strings

✦ Lists

✦ Libraries in Python

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 **144** of the main course book.

Begin by explaining what functions are and how they help break down large tasks into smaller, manageable tasks.

Introduce the syntax for defining a function in Python using def.

Explain the difference between built-in functions and user-defined functions. Discuss examples of

built-in functions such as print(), input(), and len().

Discuss the concept of strings in Python, and explain how to create single-line strings.

Introduce escape sequences and demonstrate how to use them in strings.

Introduce lists in Python and explain how to create lists and access their elements.

Explain how to modify list elements and perform operations like appending, inserting, and removing items.

Explain the various list methods such as append(), extend(), remove(), pop(), and sort().

Demonstrate how to import a library and use its functions to perform mathematical and random operations.

Extension

Ask the students some oral questions based on this chapter.

Q. What is the purpose of functions in Python?

Q. How can you define a function and call it in Python?

Q. What are the different types of strings in Python, and how do escape sequences work?

Q. What operations can you perform on a list in Python?

Q. How do you access items in a list using both positive and negative indexing?

Q. What are libraries in Python, and why are they useful?

Q. How do you use the math and random libraries in Python to perform tasks?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **152**.

Ask the students to complete the elements like **RAPID RECALL** given on pages **147** and **152**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page **147**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **162** and **163** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **164** 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 **163** 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

Create a Python program that takes user input, checks the validity of the input using string functions,

and manipulates the string by performing tasks like converting it to uppercase or reversing it.

Encourage students to experiment with the random library by creating a simple random quiz that generates questions for addition, subtraction, or multiplication.

10 Data Science

Teaching Objectives

Students will learn about:

✦ What is Data Science?

✦ What is Data?

✦ Source of Data

✦ Applications of Data Science

✦ Tools and Technologies used in Data Science

✦ Data Science in Everyday Life

✦ Artificial Intelligence and Data Science

Number of Periods	
Theory	Practical
3	0

Teaching Plan

Before starting the chapter, ask the students to solve the question in **BRIDGE BACK** given on page **166** of the main course book.

Begin by discussing what data is and how it is collected. Introduce the concept of data as raw facts that need to be processed and analysed.

Explains how data science helps us make decisions and predictions by finding patterns in data.

Discuss the importance of data in modern technology and everyday life, including entertainment platforms like Netflix and YouTube.

Introduce the three types of data: structured, unstructured, and semi-structured. Explain the differences with examples.

Discuss various sources of data such as sensors, social media, surveys, and apps.

Discuss how data drives decision-making and innovations in various industries like healthcare, business, and education.

Discuss how Data Science is used in business, healthcare, education, sports, and agriculture to optimise processes and predict trends.

Introduce the tools used in data collection and analysis, such as spreadsheets, forms, and Python.

Explain how Python is used for data processing, analysis, and visualisation. Discuss its role in Data Science.

Introduce basic Python functions for data handling like sum(), average(), and plot() for creating basic graphs.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Data Science and why is it important?

Q. What are the differences between structured, unstructured, and semi-structured data?

Q. How does data help in making predictions and improving services in industries like healthcare and business?

Q. What tools and technologies are commonly used in Data Science?

Q. How can data be visualised to understand trends and patterns?

Q. How do social media platforms use Data Science to improve user experience?

Q. How can Python be used to analyse and visualise data?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **167**.

Ask the students to complete the elements like **RAPID RECALL** given on page **169**.

Encourage the students to complete tasks like **INTERDISCIPLINARY LEARNING** given on page **171**.

Motivate the students to complete activities such as **LIVE LEARNING** on page **172**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **173** and **174** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **175** 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 **175** 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

Conduct a class survey on how students use Data Science tools in their daily lives (e.g., fitness apps, weather apps, or shopping recommendations). Students will collect the responses, analyse the data, and present a visual summary using a pie chart or bar chart.

Ask students to create a report in Excel with data on their favourite fruits and analyse it using charts and functions like AVERAGE and SUM.

11 VEXcode VR: Drive, Sense and Create

Teaching Objectives

Students will learn about:

✦ Virtual Robots

✦ Getting Started with VEXcode VR

- ✦ Understanding the Playground Window
- ✦ Types of Blocks in VEXcode VR
- ✦ The Drivetrain Blocks
- ✦ Creating and Saving a Project
- ✦ Control Blocks
- ✦ Variable Blocks
- ✦ Using the Drawing Blocks in VEXcode VR
- ✦ Using Eye Sensing Blocks
- ✦ Using Distance Sensing Blocks
- ✦ Using Magnet Blocks

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 **177** of the main course book.

Discuss the concept of virtual robots and how they operate in a digital environment. Explain how virtual robots can be programmed using VEXcode VR and help teach robotics without physical hardware.

Explain the different types of virtual robots (educational, simulation, entertainment).

Discuss the importance of virtual robots for testing and learning, especially in a safe, risk-free environment.

Explain the different types of sensors used in virtual robots, such as distance sensors, gyro sensors, and eye sensors.

Introduce the distance sensor, gyro sensor, and eye sensor and their uses in virtual robots.

Walk students through the steps to access and navigate the VEXcode VR platform, highlighting key features like the playground window and the available tools.

Students will open VEXcode VR, create a new project, and navigate the interface to understand the layout of the coding environment.

Demonstrate how to create and save a project in VEXcode VR, including selecting the appropriate playground and using the Drivetrain blocks for movement (Page 5).

Discuss the Drivetrain blocks, which control the movement of the robot, and introduce control blocks for repeating actions and making decisions.

Explain how sensors like the eye sensor and distance sensor help the robot interact with its environment. Show how to use the eye sensor to detect colors and objects (Page 17).

Extension

Ask the students some oral questions based on this chapter.

Q. What are the advantages of using virtual robots in learning robotics and programming?

Q. How do drivetrain blocks control a robot's movement?

Q. What is the role of sensing blocks in VEXcode VR?

Q. How does the repeat block help in programming?

Q. What are magnet blocks, and how do they help in virtual robotics?

Q. How does sensing enable robots to interact with their environment?

Q. Explain the significance of the pen block in drawing geometric shapes.

Q. What is the purpose of control blocks in programming a robot?

Q. How do you use eye sensors to detect and respond to colors?

Q. How would you use distance sensors to help the robot avoid obstacles?

Evaluation

Ask the students to complete the elements like **ASK AI AGENT** given on page **196**.

Ask the students to complete the elements like **RAPID RECALL** given on page **194**.

Encourage the students to complete tasks like **EXPERIENTIAL LEARNING** given on page **194**.

After explaining the chapter, let the students do the **LEARNING LOGS** on pages **196** to **198** in the main course book. Tell the students to try sections such as **CODE CHECK** given on page **198** 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 **198** 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

Have students program a virtual robot to navigate through a maze, using sensors to avoid obstacles and reach the goal.

Encourage students to experiment with using different sensor blocks and control logic to make the robot perform more complex tasks.