TRACKPAD

Ver. 5.1

8

Teacher's Manual

Extended Support for Teachers

ORANGE
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Teacher's Time Table

Periods / Days	0	I	II	III	IV	BREAK	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

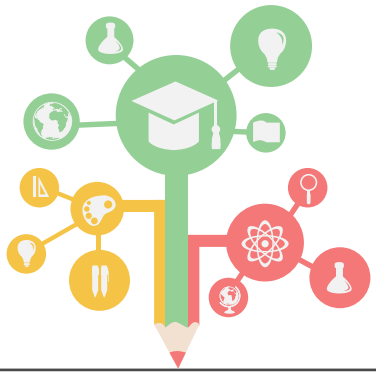
Age 11 - 20 Years

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 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.

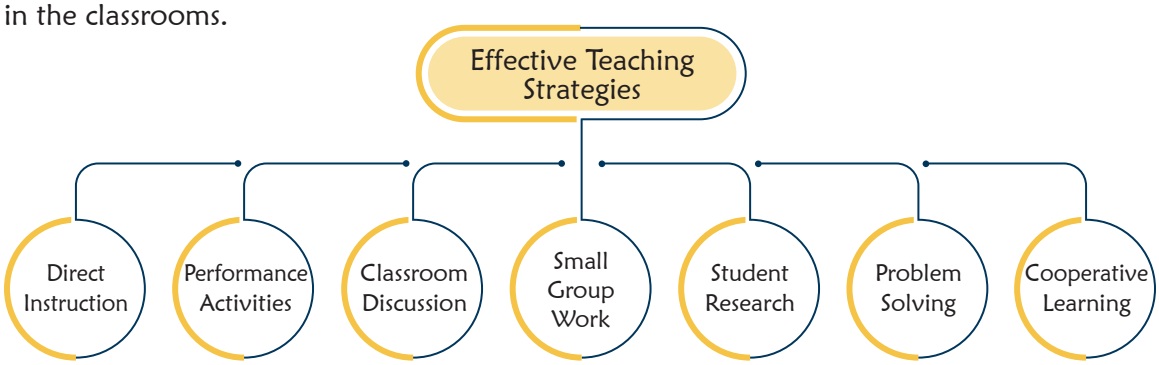
After the class

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

"Knowing yourself is the beginning of all wisdom."

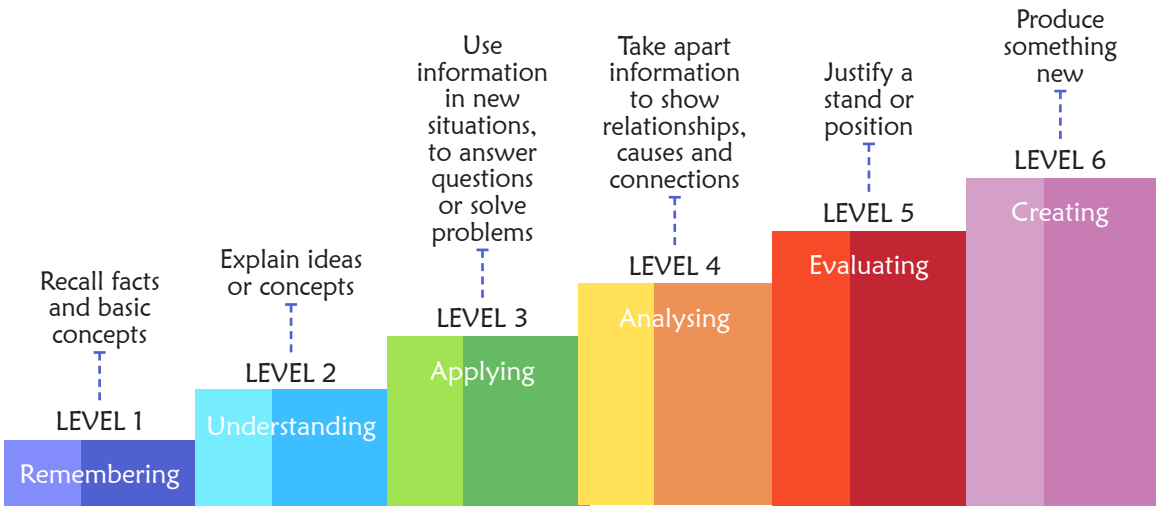
Teaching Strategies

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



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."

CLASS 8

LESSON PLAN

1 Networking Concepts

Teaching Objectives

Students will learn about

- Computer Network
- Need for Computer Networking
- Components of a Communication System
- Requirements for Computer Networking
- Network Terminologies
- Types of Networks
- Network Architecture
- Topologies
- Networking Transmission Media
- Protocols

Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 7 to understand the recap of the topic.

While teaching this chapter, tell the students that the process of connecting computers and peripheral devices with each other to exchange data is called computer networking.

Tell the students about the meaning and basics of computer network.

Share with the students the need for computer network – for resource sharing and for communication.

Discuss with the students the advantages of a computer network.

Introduce network terms like Server (host computer) and Client (dependent on server).

Explain the different types of servers to the students covering dedicated server, print server, database server, network server and web server.

Tell the students about the components required for a network covering NIC, hub/switch, router, modem and networking cable.

Share with the students that on the basis of geographical area covered, the networks can be classified into LAN (Local Area Network), MAN (Metropolitan Area Network), WAN (Wide Area Network), PAN (Personal Area Network) and CAN (Campus Area Network).

Introduce Topology as geometric arrangement of computers or nodes in a network.

Explain the difference between different types of topologies covering bus topology, ring topology, star topology, tree topology and mesh topology.

Tell the students that the network architecture defines the overall design of the computer network.

Share with the students the two types of network architectures as Peer-to-Peer network and Client-Server network.

Share with the students about the wireless networking technologies detailing about Wi-Fi and Bluetooth.

Introduce Protocol as a set of rules that govern the communication between the computers on a network.

Discuss briefly about the different types of protocols explaining about HTTP, HTTPS, FTP, TC/IP, POP3, IMAP and SMTP.

Ask the students to solve the exercise **I Know** given on page number 15.

Ask the students to solve the exercise **Quiz Bee** given on page number 19.

Extension

Ask the students some oral questions based on this chapter.

Q. Define computer network.

Q. What is the need for a computer network?

Q. What are the advantages of a computer network?

Q. Define server / client.

Q. What are the different types of computer servers?

Q. What are the components required for a network?

Q. Define LAN / MAN / WAN / PAN / CAN.

Q. Define Topology.

Q. Name different types of topologies.

Q. What is meant by protocol?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 20, 21 and 22 in the main course book in the form of Assess Yourself. Tell them to solve the technology literacy skill developing exercise as Coding Zone given on pages 23 and 24.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 23 in the main course book. This will enhance the ability of the students and serve as a communication and technology literacy activity.

Ask the students to try Video based question given on page 22 in the computer lab to enhance media literacy skills.

Suggested Activity

Ask the students to make models of different types of topologies using marbles and used wire pieces / straws.

2 Animation in Krita

Teaching Objectives

Students will learn about

- Krita
- Creating a Simple Animation

Number of Periods	
Theory	Practical
1	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 25 to understand the recap of the topic.

Begin with introduction of Krita as a free and open-source graphics editor.

Let them know about the features of Krita.

Make the students aware of how to create a new file in Krita.

Explain to the students the basic concepts of Animation in Krita like Stage, Timeline, Frames and Keyframes.

Let the students know how to create an animation of bouncing ball in Krita.

Ask the students to solve the exercise **I Know** given on page number 28.

Ask the students to read the **Quiz Bee** given on page number 32.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Krita?

Q. Name the components of Krita.

Q. What are the features of Krita?

Q. What is animation?

Q. What is stage in animation mode of Krita?

Q. What is timeline used for in Krita?

Q. What is the main drawing area in which you create and view your artwork?

Q. Which feature of Krita lets you make your drawings move, just like a cartoon?

Q. Which type of animation does Krita support?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 33 and 34 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking skill developing exercise as Coding Zone given on page 36.

Take the students to the computer lab and let them practice the activity given in the Lab and Fun Activity section on page 35 and 36 in the main course book. This will enhance the ability of the students and serve as a a creativity and technology literacy activity.

Ask the students to carry out self reflection session given on page 32 in the class only to enhance collaboration and communication skills.

Suggested Activity

Ask the students to create an animation where two cars are coming on a road from opposite directions and crash in the center.

3 Dynamic Web Pages in HTML5

Teaching Objectives

Students will learn about

- JavaScript—A Scripting Language
- Features of JavaScript
- Using JavaScript
- Creating a Web Page with Internal JavaScript
- Creating a Web Page with External JavaScript
- Statements in JavaScript
- Input and Output in JavaScript
- Some More programs

Number of Periods	
Theory	Practical
2	3

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 38 to understand the recap of the topic.

Introduce the students with JavaScript as a scripting language used to design a web page.

Demonstrate the features of JavaScript which explains that it is used in both client and server side applications.

Tell the students about using JavaScript and the methods of for the same which are:

- Internal JavaScript
- External JavaScript

Explain the students how to create a web page with internal JavaScript in detailed steps.

Demonstrate to the students how to create a web page with external JavaScript in detailed manner.

Explain the statements in javaScript to students and tell them the involved statements which are:

- Keyword
- Variables
- Operators
- Expressions
- Comments

Tell the students that JavaScript allows us to take input and display output with the help of different methods.

Explain some more programs for practise using the JavaScript language.

Ask the students to solve the exercise **I Know** given on page number 40.

Ask the students to solve the exercise **Quiz Bee** given on page number 43.

Extension

Ask the students some oral questions based on this chapter.

Q. What is JavaScript?

Q. What are features of JavaScript?

Q. How can JavaScript be used?

Q. Define:

a. Internal JavaScript b. External JavaScript

Q. How can a web page be created with internal JavaScript?

Q. How can a web page be created with external JavaScript?

Q. What are statements in JavaScript?

Q. Define:

a. Keywords b. Variables c. Operators

d. Expressions e. Comments

Q. Define input in JavaScript.

Q. Define output in JavaScript.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 47, 48 and 49 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking skill developing exercise as Coding Zone given on page 50.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 50 in the main course book. This will enhance the ability of the students and serve as a critical thinking and technology literacy activity.

Ask the students to carry out Group Discussion session given on page 49 in the class only to enhance social interaction and communication skills.

Suggested Activity

Ask the students to create a program to display product of three numbers and display the result. Take the input from the user.

4 Latest IT Trends

Teaching Objectives

Students will learn about

- E-commerce
- Electronic Fund Transfer
- Blockchain
- Artificial Intelligence
- Augmented Reality and Virtual Reality
- Internet of Things
- 3D Printing
- RPA (Robotic Process Automation)

Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 51 to understand the recap of the topic.

Introduce the students with E-commerce along with the history of commerce.

Define the types of e-commerce used in daily life which are:

- Business-to-Business (B2B)
- Business-to-Consumer (B2C)
- Consumer-to-Consumer (C2C)

Explain the Applications of E-Commerce to the students in detail which are:

- E-Shopping
- E-Banking
- M-Commerce

Explain the meaning of Electronic Fund Transfer and the purpose in daily life.

Define the meaning of Blockchain and its purpose in daily life.

Let the students know that AI is the branch of computer science that aims at creating expert and intelligent computer systems which simulate certain human qualities such as learning, reasoning, seeing, hearing, sensation, etc.

Make the students aware of some main areas of application of AI:

- Expert System
- Natural Language Processing
- Intelligent Agents
- Pattern Recognition
- Robotics
- Intelligent Apps (I-Apps)

Explain to the students the differences between Augmented Reality (AR) and Virtual Reality (VR).

Let the students know about Internet of Things (IoT).

Let the students know about the fields of major applications of 3D Printing:

- Education
- Rapid Prototyping (RP) Method
- Medicine
- Constructions
- Art and Jewellery

Make the students aware of Robotic Process Automation (RPA).

Ask the students to solve the exercise **Quiz Bee** given on page number 53.

Ask the students to solve the exercise **I Know** given on page number 54.

Extension

Ask the students some oral questions based on this chapter.

Q. What is e-commerce?

Q. What is electronic fund transfer?

Q. What is blockchain?

Q. What is an Artificial Intelligence?

Q. What is an Augmented Reality?

Q. What is an Virtual Reality?

Q. What is an Internet of Things?

Q. What is an 3D Printing?

Q. What is an RPA?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 62, 63 and 64 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking skill developing exercise as Coding Zone given on page 65.

Take the students to the computer lab and let them practise the activity given in the Fun Activity and Lab Activity section on page 64 in the main course book. This will enhance the ability of the students and serve as a critical thinking, creativity and technology literacy activity.

Ask the students to try Self Reflection session given on page 61 to highlight elements like initiative on part of the students.

Ask the students to try Video based question given on page 64 in the computer lab to enhance media literacy skills.

Suggested Activity

Ask the students to try any digital assistant like Alexa or Siri and ask "What is Virtual Reality?".

5 Cloud Computing

Teaching Objectives

Students will learn about

- What is Cloud Computing?
- How does Cloud Computing Work?
- Cloud Storage Service Providers
- Storing Data Using Cloud Computing

- Accessing OneDrive using App
- Accessing OneDrive using Web Browser
- Creating Files or Folder on OneDrive
- Uploading File or Folder on OneDrive
- Sharing Files
- File Shared with You
- Types of Cloud Services

Number of Periods	
Theory	Practical
2	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 66 to understand the recap of the topic.

Explain the students the meaning of Cloud Computing with the help of relatable example.

Make the students aware of the benefits of cloud computing.

Demonstrate to the students how cloud computing works and tell them that it is divided into two sections:

- Front end
- Back end

Share the information about the Cloud storage service providers with the students which are:

- DropBox
- ZipCloud
- iCloud
- Google Drive

Tell the students how to store data using Cloud Computing in detailed steps. Also, share how to access OneDrive on older versions of Windows.

Explain the detailed steps with the students for:

- Creating files on OneDrive
- Uploading files or folders on OneDrive

Share the steps to share the files with the students while demonstrating the same in the lab. Also tell them how to access the files which are shared with you.

Explain the types of Cloud Services with the students which are:

- Public Cloud
- Private Cloud
- Hybrid Cloud
- Community Cloud

Ask the students to solve the exercise **I Know** given on page number 74.

Ask the students to solve the exercise **Quiz Bee** given on page number 75.

Extension

Ask the students some oral questions based on this chapter.

Q. What is cloud computing?

Q. What are benefits of cloud computing?

Q. How does cloud computing work?

Q. What are some cloud storage providers?

Q. How can OneDrive be accessed on older versions of Windows?

Q. How to access OneDrive on older versions of Windows?

Q. How can files be shared in drive?

Q. Define the following:

a. Public Cloud

b. Private Cloud

c. Hybrid Cloud

d. Community Cloud

Evaluation

After explaining the chapter, let the students do the exercises given on pages 76, 77 and 78 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking and technology literacy skill developing exercise as Coding Zone given on page 79.

Take the students to the computer lab and let them practise the activity given in the Lab and Fun Activity section on page 78 and 79 in the main course book. This will enhance the ability of the students and serve as a creativity, critical thinking and technology literacy activity.

Ask the students to try Self Reflection session given on page 76 to highlight elements like initiative on part of the students.

Suggested Activity

Ask the students to search about some more examples of online storage service providers.

6 Algorithmic Intelligence

Teaching Objectives

Students will learn about

- Information Processing
- Conditions in a Program

Number of Periods	
Theory	Practical
2	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 135 to understand the recap of the topic.

Begin with introduction of algorithm as a step-by-step instructions in a sequential manner to solve a problem.

Let them know that a flowchart is a pictorial representation of an algorithm.

Make the students aware of information processing.

Make the students understand that Binary code is the fundamental form of the programming data that is directly interchanged by a computer.

Explain about conditions in a program that are required to make certain decisions based on the logic of the program.

Also let them know about if-then-else statements and conditions related to them.

Ask the students to solve the exercise **I Know** given on page number 137.

Ask the students to solve the exercise **Quiz Bee** given on page number 138.

Extension

Ask the students some oral questions based on this chapter.

Q. What is algorithm?

Q. What is a flowchart?

Q. Name the base to write a program.

Q. What is information processing?

Q. What is the importance of processing of information?

Q. What is binary code?

Q. Define conditions in a program.

Q. Why are conditional statements used in a program?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 139 and 140 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking and Technology Literacy skill developing exercise as Coding Zone given on page 141.

Take the students to the computer lab and let them practise the activity given in the Lab and Fun activity section on page 140 in the main course book. This will enhance the ability of the students and foster Critical Thinking, Creativity and collaborative skills.

Ask the students to try Self Reflection session given on page 138 to highlight elements like initiative on part of the students.

Suggested Activity

Ask the students to write any if-then-else conditional statements.

7 Control Structures in Python

Teaching Objectives

Students will learn about

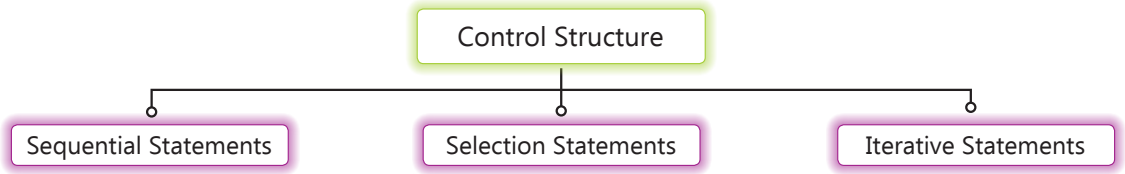
- Control Structure
- Sequential Statements
- Selection Statements
- Iterative Statements
- Jump Statements
- Some More Programs

Number of Periods	
Theory	Practical
2	3

Teaching Plan

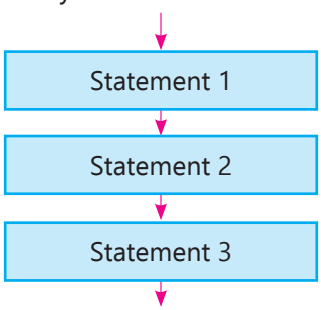
Before starting the chapter, ask the students to read the comic given on page 91 to understand the recap of the topic.

Define the meaning of Control Structure in Python to the students which are:



Define each of them in detail along with their syntax.

Explain the Sequential Statements with syntax:



Define the Selection Statements along with the types and syntax:

i. if statement

ii. if-else

iii. if-elif-else-statement

iv. Nested if statement

Also, demonstrate the use of these with the help of some programs.

Explain the Iterative Statement to the students along with the syntax and types:

i. For loop

ii. While loop

Also, demonstrate the use of these with the help of some programs.

Explain the meaning of Jump Statements and its types:

i. Break Statement

ii. Continue Statement

Also, demonstrate the use of these with the help of some programs.

Share some more programs with the students to make them learn better.

Ask the students to solve the exercise **I Know** given on page number 97.

Extension

Ask the students some oral questions based on this chapter.

Q. What is control structure?

Q. What are sequential statements?

Q. What are selection statements?

Q. Define if statement.

Q. Define nested if statements.

Q. What are iterative statements?

Q. Define for loop statement.

Q. What are jump statements?

Q. What is the break statement used for?

Q. What is the function of the continue statement?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 104 to 107 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking and technology literacy skill developing exercise as Coding Zone given on page 108.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 107 in the main course book. This will enhance the ability of the students and serve as a critical thinking and technology literacy activity.

Ask the students to try Self Reflection session given on page 104 to highlight elements like flexibility on part of the students.

Ask the students to try Video based question given on page 107 in the computer lab to enhance media literacy skills

Suggested Activity

Ask the students to create a program to display odd number in between 1 to 30 using the continue statement.

8 Functions, String and List in Python

Teaching Objectives

Students will learn about

- Introduction to Python Functions
- String
- List
- Some More Programs

Number of Periods	
Theory	Practical
2	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 109 to understand the recap of the topic.

While teaching this chapter revise Python for the students and repeat the features of Python from the earlier class.

Demonstrate to the students the steps involved in using the FUNCTIONS using programs and syntax which are:

- Name of the function
- Arguments
- Statements
- Return Value

Explain the features of Functions and the components of Python function in detail.

Share the detail about the types of Python Function with the students which are:

- Built-in Functions
- User-defined Functions

Explain the detailed steps with the students regarding how to:

- Create a function
- Call a function

Define the meaning of String and the types of strings along with examples of:

- Creating Strings
- Multiline Strings

- Using Escape Sequences with Strings
- Traversing a String
- String Operators
- String Built-in Functions

Define the meaning of List and the types of strings along with examples of:

- Creating a List: Empty List, Mixed Data Type List and Nested List
- Accessing a List
- List Functions: append( ), extend( ) and del( )

Ask the students to solve the exercise **Quiz Bee** given on page number 116.

Ask the students to solve the exercise **I Know** given on page number 120.

Share some more programs with the students to make them learn better.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Python Function

Q. What are the features of function?

Q. What are the components of Python Function?

Q. What are types of function in Python?

Q. How can we create a function?

Q. What is a string?

Q. Name the basic string operators in Python.

Q. What is a list?

Q. Define the types of list.

Q. Define the list functions.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 123, 124 and 125 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking and technology literacy skills developing exercise as Coding Zone given on page 126.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 125 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

Ask the students to create a program to calculate the area using:

i. append( )

ii. extend( )

9 Artificial Intelligence and Its Domains

Teaching Objectives

Students will learn about

- Categories of Artificial Intelligence
- Advantages of Artificial Intelligence
- Risk and Barriers of Artificial Intelligence
- Domains of Artificial Intelligence

Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 128 to understand the recap of the topic.

Define the categories of AI in brief to the students:

- Narrow AI
- General AI
- Super AI

Tell the students about the advantages of AI in detail:

- Process Automation
- Accuracy
- Take Decisions Rationally
- Quick Decision Making
- Quicker Data Analysis
- Ability to Complete Dangerous Tasks

Share the risk and barriers of AI with the students:

- High Cost of Creation
- Unemployment
- No Out-of-the-box Thinking
- Making Human Lazy
- No Emotions

Explain the Domains of AI to the students along with the examples for better understanding:

- Data
- Computer Vision
- Natural Language Processing

Ask the students to solve the exercise **I Know** given on page number 131.

Ask the students to solve the exercise **Quiz Bee** given on page number 134.

Extension

Ask the students some oral questions based on this chapter.

Q. What is AI?

Q. Define the categories of AI:

i. Narrow AI ii. General AI iii. Super AI

Q. What are the advantages of AI?

Q. What are the risks of AI?

Q. Explain the domains of AI.

Q. Define Data.

Q. Define Computer Vision.

Q. How does computer vision work?

Q. Define NLP.

Q. Give examples of three AI applications based on NLP.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 135, 136 and 137 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking skill developing exercise as Coding Zone given on page 138.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on pages 138 in the main course book. This will enhance the ability of the students and serve as a critical thinking and technology literacy activity.

Ask the students to try Video based question given on page 137 in the computer lab to enhance media literacy skills.

Suggested Activity

Ask the students to play an online game which is based on NLP and Computer Vision.

10 Fields of Artificial Intelligence

Teaching Objectives

Students will learn about

- Most Common Fields Which Use AI

- AI in Apps
- Concept of Smart Living

Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 139 to understand the recap of the topic.

Explain the most common fields which use AI in detail to students for better understanding.

Define these fields with examples:

- Smartphone Industry
- Banking and Financial Sector
- Autonomous Vehicles
- Navigation
- Healthcare
- Social Media Platforms
- E-Commerce
- Security and Surveillance
- Autonomous Drones
- Education

Explain to the students about the use of AI in Apps:

- Siri
- Cortana
- ELSA Speak
- Fyle
- Ola/Uber
- Alexa
- Google Assistant
- Socratic
- Youper

Tell the students about the concepts of Smart Living in detail with proper examples:

- Smart Homes: With benefits of smart home and devices used in smart homes
- Smart Cities: Benefits of smart cities and challenges of establishing smart cities

Ask the students to solve the exercise **Quiz Bee** given on page number 142.

Extension

Ask the students some oral questions based on this chapter.

Q. Explain the most common fields which use AI:

i. Smartphone Industry
ii. Social Media Platforms
iii. Banking and Financial Sector
iv. E-Commerce
v. Autonomous Vehicles
vi. Security and Surveillance

vii. Navigation

viii. Autonomous Drones

ix. Healthcare

x. Education

Q. Name a few apps that use AI.

Q. Define the concept of smart living.

Q. Define smart homes.

Q. Write the benefits of smart homes.

Q. Write the devices used in smart homes.

Q. Define smart cities.

Q. Write the benefits of smart cities.

Q. Write the challenges of establishing smart cities.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 149, 150 and 151 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking skill developing exercise as Coding Zone given on page 152.

Take the students to the computer lab and let them practise the activity given in the Lab Activity and Fun Activity section on pages 152 in the main course book. This will enhance the ability of the students and serve as a creativity, critical thinking and information technology activity.

Ask the students to try Self Reflection session given on page 148 to highlight elements like flexibility on part of the students.

Suggested Activity

Ask the students to look around their environment to search for smart home devices and in your locality.

11 Introduction to SDGs and Data Science

Teaching Objectives

Students will learn about

- Challenges before Sustainable Development
- Sustainable Development Goals (SDGs)
- Data Science
- Why Data Science?

- Role of Data Scientist
- Solving Problems with Data Science
- Tools for Data Science
- AI and Data Science

Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 153 to understand the recap of the topic.

Explain to the students about the challenges before sustainable developments in details.

Explain all 17 Sustainable Development Goals (SDGs) in detail with the students:

1. No Poverty
2. Zero Hunger
3. Good Health and Wellbeing
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace Justice and Strong Institutions
17. Partnerships for the Goals

Explain the meaning of Data Science to the students.

Make the students aware of the role of Data Scientist.

Explain how can we solve problems with Data Science with following approaches:

- Descriptive Analytics
- Predictive Analytics

Define the tools used for Data Science which are:

- R Scripting Language
- Structured Query Language (SQL)
- Python
- Hadoop
- Tableau

Explain to the students about the mechanism of AI and Data Science in brief.

Ask the students to solve the exercise **I Know** given on page number 159.

Ask the students to solve the exercise **Quiz Bee** given on page number 160.

Extension

Ask the students some oral questions based on this chapter.

Q. What is SDG?

Q. Define all 17 SDGs in brief.

Q. What is Data Science?

Q. What is Big Data?

Q. Define the categories of Data.

Q. Explain why we need Data Science.

Q. Define the role of data Scientist.

Q. Explain the two approaches of solving problem with Data Science.

Q. Explain the tools for Data Science.

Q. Explain the relation between AI and Data Science.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 162, 163 and 164 in the main course book in the form of Assess Yourself. Tell them to solve the critical thinking skill developing exercise as Coding Zone given on page 165.

Take the students to the computer lab and let them practise the activity given in the Lab Activity and Fun Activity section on pages 164 in the main course book. This will enhance the ability of the students and serve as a technology literacy and information literacy activity.

Suggested Activity

Ask the students to make a chart on SDG and involve all of them with examples.