8

TRACKPAD

Ver. 5.0

Teacher's Manual

Extended Support for Teachers

ORANGE
www.orangeeducation.in
www.thetouchpad.com

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

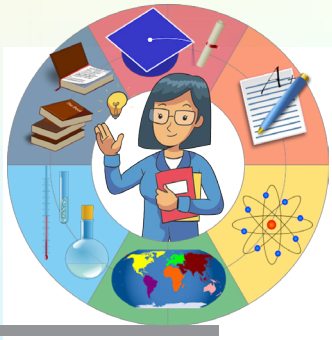
"If you cannot do great things, do small things in a great way."

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.

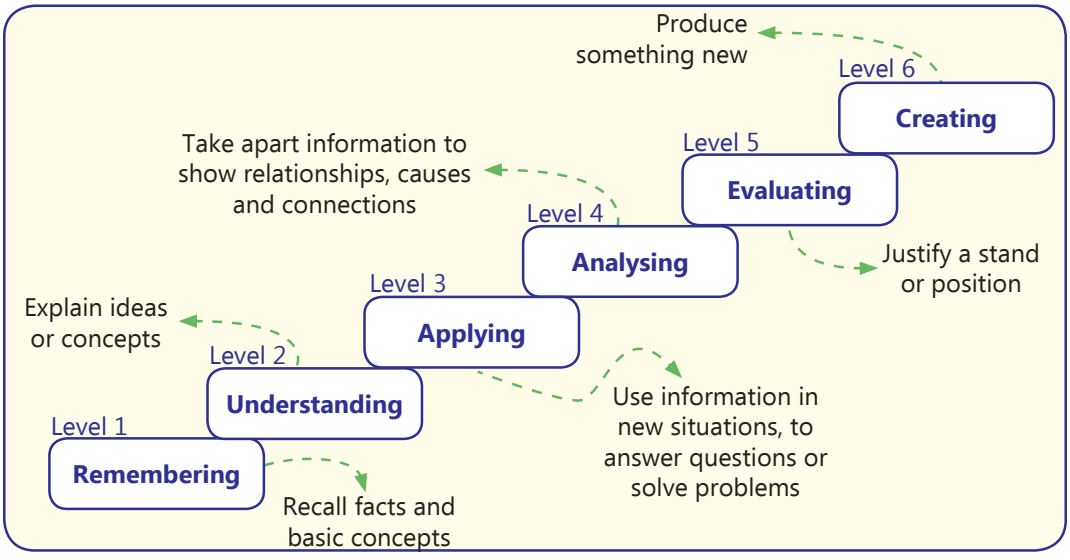
"Knowing yourself is the beginning of all wisdom."

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

Trackpad Ver 5.0

1. Networking Concepts

Teaching Objectives

Students will learn about

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

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 14.

Ask the students to solve the exercise **Quiz Bee** given on page number 18.

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 19, 20 and 21 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on pages 22 and 23..

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 22 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. Introduction to Photoshop 2021

Teaching Objectives

Students will learn about

- Features of Adobe Photoshop
- Starting Photoshop and Creating a New Document
- Components of the Photoshop Window
- Opening an Image
- Selection Tools
- Move Tool
- Cropping Tools
- Pattern Stamp Tool
- Clone Stamp Tool
- Changing the Size of an Image
- Saving a Photoshop File

Number of Periods	
Theory	Practical
2	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 24 to understand the recap of the topic.

While teaching this chapter, tell the students that Photoshop is a designing software developed in 1988.

Introduce the students with Photoshop 2021 using examples.

Explain the features of Photoshop to the students in detail.

Demonstrate to the students the steps involved in opening Photoshop 2021.

Demonstrate to the students the steps involved in creating a new document in Photoshop.

Explain all the components of Photoshop interface with proper labelled pictures.

Tell the students the steps to open an image in Photoshop.

Demonstrate to the students the steps involved in placing an image in an existing document in Photoshop.

Explain to the students the following tools of Photoshop and explain them in details with steps:

a. Selection tools

- Rectangular Marquee tool
- Lasso tool
- Polygonal Lasso tool
- Magnetic Lasso tool
- Object Selection tool
- Quick Selection tool
- Magic Wand tool

b. Move tool

c. Cropping tools

- Crop tool
- Perspective Crop tool
- Slice tool and Slice Select tool

d. Pattern Stamp tool

e. Clone Stamp tool

f. Change the size of an image

Tell the students the steps to save a file in Photoshop along with exiting Photoshop.

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

Ask the students to solve the exercise **Quiz Bee** given on page number 30.

Extension

Ask the students some oral questions based on this chapter.

Q. What is the role of Adobe Photoshop?

Q. What are the features of Photoshop?

Q. What is the use of Selection tool?

Q. What is the use of Move tool?

Q. What is the use of Cropping tool?

Q. What is the use of Pattern Stamp tool?

Q. What is the use of Clone Stamp tool?

Q. What is the shorcut key to change the size of an image?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 39, 40 and 41 in the main course book in the form of Assess Yourself. Tell them to solve the interdisciplinary and computational skills developing exercise as Coding Zone given on page 42.

Take the students to the computer lab and let them practise the activity given in the Fun activity and Lab Activity section on pages 41 and 42 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 38 to highlight elements like flexibility on part of the students.

Ask the students to carry out Group Discussion session given on page 41 in the class only to enhance social interaction and communication skills.

Suggested Activity

Ask the students to crop two images and make them one using proper Photoshop tools taught in this chapter.

3. More on Photoshop 2021

Teaching Objectives

Students will learn about

- ☞ Painting Tools
- ☞ Retouching Tools
- ☞ Navigation Tools
- ☞ Components of the Layers Panel
- ☞ Eraser Tool
- ☞ Horizontal Text Tool
- ☞ Working with Layers

Number of Periods	
Theory	Practical
2	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 43 to understand the recap of the topic.

While teaching this chapter, revise the features and tools of Photoshop 2021 for the students taught in the earlier chapter.

Explain to the students the following tools of Photoshop and explain them in details with steps:

a. Painting tools

- Eye Dropper tool
- Brush tool
- Background colour
- 3D Material Drop tool
- Gradient tool
- Changing foreground
- Paint Bucket tool
- Eraser tool

Demonstrate to the students the use of Eraser tool.

b. Retouching tools

- Spot Healing Brush tool
- Content Aware Move tool
- Pattern Stamp tool
- Dodge, Burn and Sponge tool
- Rotate View tool
- Patch tool
- Red Eye tool
- Blur, Sharpen and Smudge tool
- Hand tool
- Zoom tool
- Image menu

Make the students aware of the Horizontal Text tool. Also explain the steps to use this tool.

Tell the students about the Navigation tools such as:

- Hand tool
- Rotate View tool
- Zoom tool
- Image menu

Ask the students to solve the exercise **I Know** given on page number 49.

Ask the students to solve the exercise **Quiz Bee** given on page number 56.

Demonstrate to the students the Layers in Photoshop 2021 and explain all the components of layers panel, steps involved in creating a new layer and copying and moving a layer.

Extension

Ask the students some oral questions based on this chapter.

Q. What is the use of Painting tool?

Q. Name different types of painting tools in Photoshop 2021?

Q. What is Eraser tool in Photoshop 2021? How is it used?

Q. What is the use of Retouching tool?

Q. Name various retouching tools in Photoshop 2021.

Q. What is the Horizontal Text tool in Photoshop?

Q. What is the use of Navigation tool?

Q. What are layers?

Q. What are the components of layers panel?

Q. Write the steps to create a new layer in Photoshop 2021.

Q. How can we copy and move a layer in Photoshop 2021?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 59, 60 and 61 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 62.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 61 in the main course book. This will enhance the ability of the students and serve as an interdisciplinary and technology literacy activity.

Ask the students to try Self Reflection session given on page 58 to highlight elements like initiative on part of the students.

Ask the students to carry out Group Discussion session given on page 61 in the class only to enhance social interaction and communication skills. Ask them to try Video based question given on page 61 in the computer lab to enhance media literacy skills.

Suggested Activity

Ask the students to download and edit a few images and make them one using proper tools.

4. 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 64 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 66.

Ask the students to solve the exercise **Quiz Bee** given on page number 68.

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 73 and 74 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 75.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 75 in the main course book. This will enhance the ability of the students and serve as a an interdisciplinary and technology literacy activity.

Ask the students to carry out Group Discussion session given on page 75 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.

5. 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 76 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 A:

- 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).

Explain to the students that 3D Printing is a technology which was first developed at MIT (Massachusetts Institute of Technology) in 1980s.

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 78.

Ask the students to solve the exercise **I Know** given on page number 79.

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 87 and 88 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 89.

Take the students to the computer lab and let them practise the activity given in the Fun Activity and Lab Activity section on page 89 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 86 to highlight elements like initiative on part of the students.

Ask the students to try Video based question given on page 88 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?".

6. Cloud Computing

Teaching Objectives

Students will learn about

- What is Cloud Computing?
- Cloud Storage Service Providers
- Sharing Files
- Types of Cloud Services
- How does Cloud Computing Work?
- Storing Data Using Cloud Computing
- File Shared with You

Number of Periods	
Theory	Practical
2	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 90 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 96.

Ask the students to solve the exercise **Quiz Bee** given on page number 97.

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 98 and 99 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 99.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 99 in the main course book. This will enhance the ability of the students and serve as a technology literacy activity.

Ask the students to try Self Reflection session given on page 97 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.

7. Control Structures in Python

Teaching Objectives

Students will learn about

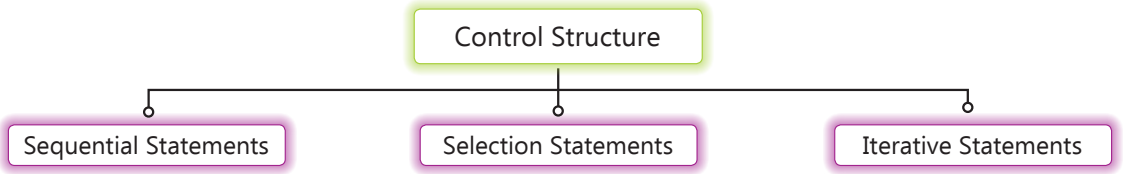
- ☞ Control Structure
- ☞ Selection Statements
- ☞ Jump Statements
- ☞ Sequential Statements
- ☞ Iterative Statements
- ☞ Some More Programs

Number of Periods	
Theory	Practical
2	3

Teaching Plan

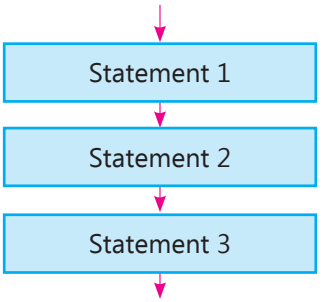
Before starting the chapter, ask the students to read the comic given on page 103 to understand the recap of the topic.

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**

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 108.

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 115, 116 and 117 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 118.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 117 in the main course book. This will enhance the ability of the students and serve as a technology literacy activity.

Ask the students to try Self Reflection session given on page 114 to highlight elements like flexibility on part of the students.

Ask the students to try Video based question given on page 117 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
- ☞ List
- ☞ String
- ☞ 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 119 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 127.

Ask the students to solve the exercise **I Know** given on page number 130.

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 133, 134 and 135 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 136.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 136 in the main course book. This will enhance the ability of the students and serve as a 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 138 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 141.

Ask the students to solve the exercise **Quiz Bee** given on page number 144.

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 145 and 146 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 147.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on pages 146 and 147 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 147 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

Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 149 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 152.

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 159, 160 and 161 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 162.

Take the students to the computer lab and let them practise the activity given in the Lab Activity and Fun Activity section on pages 161 and 162 in the main course book. This will enhance the ability of the students and serve as a technology literacy, creativity and interdisciplinary activity.

Ask the students to try Self Reflection session given on page 159 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
- ☞ Data Science
- ☞ Role of Data Scientist
- ☞ Tools for Data Science
- ☞ Sustainable Development Goals (SDGs)
- ☞ Why Data Science?
- ☞ Solving Problems with 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 163 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 along with the following:

- Big Data
- Categories of Data: Structured, Unstructured, Natural Language, Machine Generated, Graph-based or Network, Audio, Video, and Images and Streaming Data

Tell the students why we need Data Science and the aim for its use.

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 169.

Ask the students to solve the exercise **Quiz Bee** given on page number 170.

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 172 and 173 in the main course book in the form of Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on page 176.

Take the students to the computer lab and let them practise the activity given in the Lab Activity and Fun Activity section on pages 173 and 176 in the main course book. This will enhance the ability of the students and serve as a technology literacy and critical thinking activity.

Suggested Activity

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