TRACKPAD

Ver. 5.1

6

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

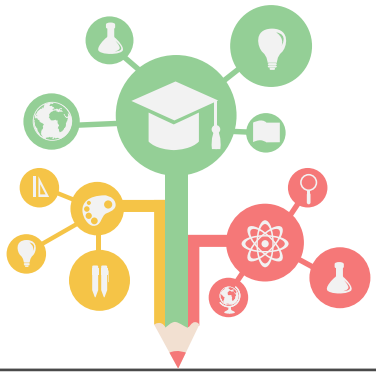
Age 11 - 20 Years

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.

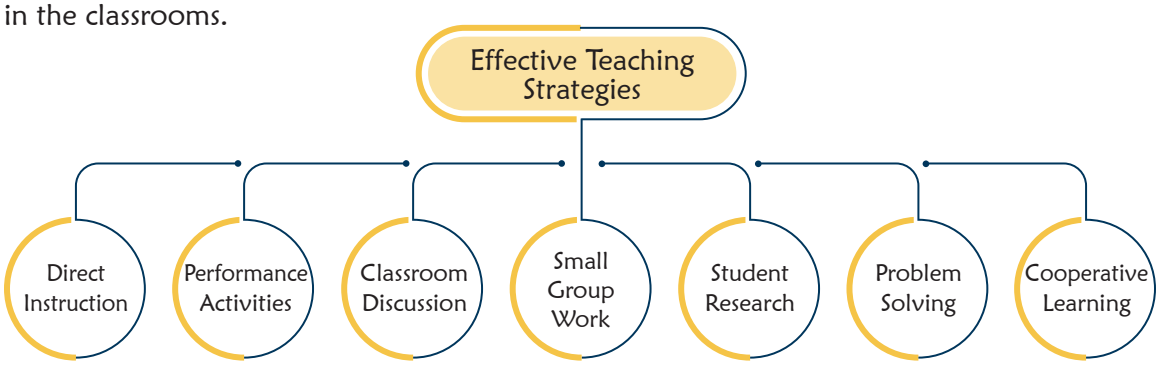
After the class

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

"Knowing yourself is the beginning of all wisdom."

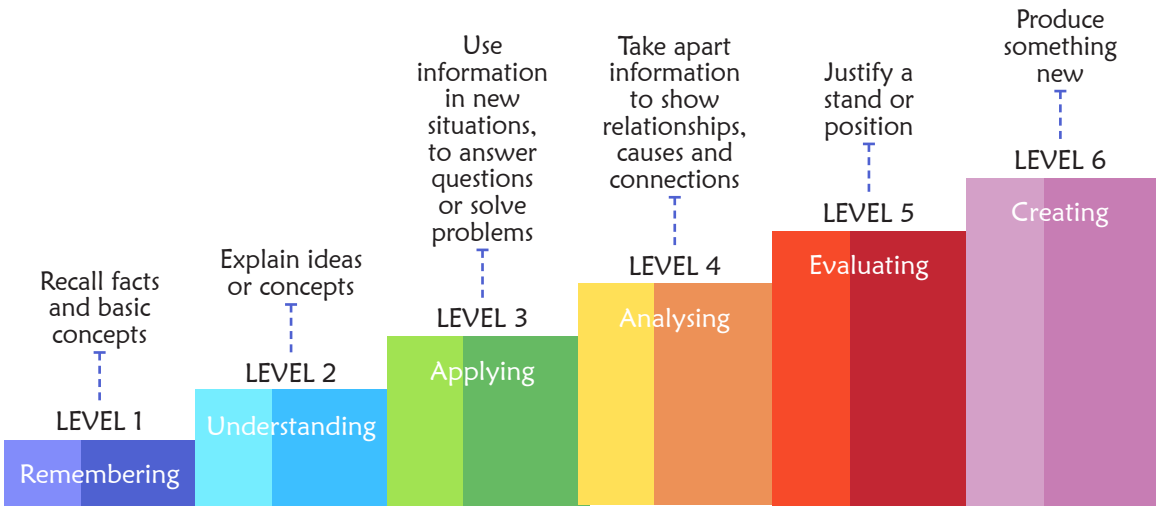
Teaching Strategies

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 6

LESSON PLAN

1 Fundamentals of Computer

Teaching Objectives

Students will learn about

- Evolution of Computers
- Categories of Computers
- Other Types of Computer
- Devices of a Computer

Number of Periods	
Theory	Practical
3	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 a computer is an electronic device that performs diverse operations with the help of instructions to process the data in order to achieve desired results.

Explain the students about the evolution of computers and tell them about computer generations:

- First Generation (Vacuum Based)
- Second Generation (Transistor Based)
- Third Generation (Integrated Circuit Based)
- Fourth Generation (Microprocessor Based)
- Fifth Generation (Artificial Intelligence)

Tell the students that on the basis of functions, computers are further divided into three categories: Analog Computer, Digital Computer and Hybrid Computer with examples.

Showcase the basic definitions of these three types of computer:

a. Analog Computer: This type of computer store data in a continuous form of physical quantities and perform calculations with the help of measures.

b. Digital Computer: This type of computer processes both numeric as well as non-numeric data. It also performs many arithmetic operations such as addition, subtraction, multiplication, division, and logical operations.

c. Hybrid Computer: This type of computer system consists of a combination of analog and digital computer systems.

Explain the students that according to size, speed, processing power and cost, computers are further divided into categories.

Tell the students that computers are categorized on the basis of:

- Size
- Speed
- Processing
- Cost

Make them understand these categories in details with examples.

- Explain Microcomputers and their examples like Desktop computer, Laptop and Tablet.
- Explain Mainframe Computer with example like IBM zSeries.
- Explain Supercomputer with examples like PARAM, Cray-1, etc.

Make them understand that there are some other special computers:

- Embedded Computer: It is further divided into Digital Camera, ATM and Microwave, etc.
- Handheld Computer: It is further divided into Smartphone, PDA, Smartwatch, Gaming Consoles, etc.

Tell the students about the working of computer and explain the working of the associated devices:

- Input Devices
- Processing Devices
- Output Devices

Ask the students to solve the exercise **Quiz Bee** given on page number 12.

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

Extension

Ask the students some oral questions based on this chapter.

Q. How has invention of computers helped us?

Q. How has evolution of computers been classified?

Q. Explain computers belonging to different generations.

Q. What is an analog computer?

Q. What is a digital computer?

Q. What is a hybrid computer?

Q. Give examples of:

- Analog Computer
- Digital computer

- Hybrid Computer

Q. What is a microcomputer?

Q. What is a minicomputer?

Q. What is a mainframe computer?

Q. What is a supercomputer?

Q. Explain embedded computer with examples.

Q. What is a handheld computer? Give three examples.

Q. Explain input devices with examples.

Q. What are processing devices? Give examples.

Q. Explain output devices with examples.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 15, 16 and 17 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 18.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 18 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 collect pictures of different types of computers and paste them on a chart paper according to the categories explained in this chapter.

2 Formulas and Functions in Excel 2021

Teaching Objectives

Students will learn about

- Data Types in Excel 2021
- Operators in Excel 2021
- Operator Precedence
- Ways to Enter a Formula in Excel 2021
- Cell Range
- Cell References
- Functions

Number of Periods	
Theory	Practical
2	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 19 to understand the recap of the topic.

Begin with introduction of data types in Excel 2021 to the students.

Share with the students the knowledge of basic elements and rules of writing a formula in Excel.

Show them the different methods of entering a formula Excel 2021.

Introduce cell referencing as the use of cell address while writing a formula.

Make them understand the different types of cell referencing and the difference between the three – Absolute, Relative and Mixed.

Explain the meaning of these three types of referencing in simple words like:

a. Absolute Referencing: It refers to a reference that is "locked" so that rows and columns won't change when copied.

b. Relative Referencing: It is the default cell reference in Excel. It is simply the combination of column name and row number without any dollar ($) sign.

c. Mixed Referencing: It is a type of Absolute reference in which either the column is made constant or the row is made constant.

Tell the students about rules for using functions and different categories of functions in Excel.

Demonstrate the use of mathematical functions – SUM, PRODUCT, MOD, SQRT, INT, POWER, COUNT, etc.

Demonstrate the use of text functions – CONCATENATE, LEFT, RIGHT, LEN, UPPER, LOWER, etc.

Demonstrate the use of logical functions – MAX, MIN and AVERAGE, etc.

Demonstrate the use of date functions – TODAY, MONTH, YEAR, DAY, etc.

Demonstrate the use of error functions – ####, #VALUE!, #N/A, etc.

Ask the students to solve the exercise **I Know** given on page number 25.

Ask the students to solve the exercise **Quiz Bee** given on page number 27.

Extension

Ask the students some oral questions based on this chapter.

Q. What are data types in Excel 2021?

Q. What are operators in Excel 2021?

Q. What is the order of operation followed in Excel 2021?

Q. Name the different elements of a formula in Excel 2021.

Q. Define cell referencing.

Q. What is a cell range?

Q. How is a cell range selected?

Q. What are functions in Excel 2021?

Q. Name some important categories of functions.

Q. State the purpose of SUM / SQRT / MOD / COUNT / LEN / RIGHT / TODAY / MAX function.

Q. What is the syntax of PRODUCT / INT / POWER / CONCATENATE / LEFT / UPPER / LOWER / MIN / AVERAGE function?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 29, 30 and 31 in the main course book as Assess Yourself. Tell them to solve the productivity & Accountability and critical Thinking skills developing exercise in the form of Coding Zone given on page 32.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 32 in the main course book. This will enhance the ability of the students and serve as a technology literacy Productivity & Accountability activity.

Ask the students to try Self Reflection session given on page 29 to highlight elements like initiative and leadership & responsibility on part of the students. Also ask the students to carry out Group Discussion session given on page 31 in the class to enhance social interaction and communication skills.

Suggested Activity

Ask the students to enter their last marksheet in Excel and calculate total marks scored, average marks scored, maximum and minimum marks amongst all the marks and the number of subjects using various functions used in Excel 2021.

3 Charts in Excel 2021

Teaching Objectives

Students will learn about

- Charts
- Advantages of Charts
- Components of a Chart
- Types of Charts
- Creating a Chart
- Changing Chart Type
- Setting the Data Range

- Moving and Resizing the Chart
- Changing Background of the Chart

Number of Periods	
Theory	Practical
2	2

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 33 to understand the recap of the topic.

Begin with explanation of the charts in Excel 2021 as representative of data in pictorial or graphical form.

Let them know various advantages of charts in Excel 2021.

Show the different components of an Excel chart.

Familiarize the students with the different types of chart options available Excel 2021.

Explain each chart type to the students with examples:

- Column chart
- Bar chart
- Line chart
- Area chart
- Pie chart
- Scatter chart
- Doughnut chart

Demonstrate the steps of:

- Creating a chart
- Changing the chart type
- Setting the data range
- Moving and resizing the chart
- Changing background of the chart

Ask the students to solve the exercise **I Know** given on page number 35.

Ask the students to solve the exercise **Quiz Bee** given on page number 37.

Extension

Ask the students some oral questions based on this chapter.

Q. Define charts in Excel.

Q. What are advantages of the chart?

Q. What is data series?

Q. What is a legend?

Q. What are gridlines in a chart?

Q. Explain different types of chart.

Q. When is a Line / Column / Pie / Bar / Area chart used?

Q. In Excel, can we change the type of an existing chart?

Q. Where are various options to change the colour of the chart area present?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 41 and 42 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 43.

Take the students to the computer lab and let them practise the activity given in the Lab Activity and Fun Activity section on pages 43 and 44 in the main course book. This will enhance the ability of the students and serve as a technology literacy and critical thinking activity.

Also ask the students to attempt Video based question given on page 42 in the computer lab to enhance media literacy.

Suggested Activity

From the previous marksheets of grade 1 to 6, collect data about your attendance in various grades. Plot a Line Chart in Excel from the data.

4 Krita - An Introduction

Teaching Objectives

Students will learn about

- Features of Krita
- Downloading and Installing Krita
- Starting Krita
- Components of the Krita Window
- Creating Graphics and Shapes
- Opening Krita Files
- Closing Krita Files

Number of Periods	
Theory	Practical
2	3

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 46 to understand the recap of the topic.

Introduction to Krita as a free and professional digital painting software.

Explain the purpose and benefits of using Krita for artists and designers.

Explain the Features of Krita and Discuss the key features like - User-friendly interface, Pop-up Palette, Brush Stabilizers, Brush Engines, Wrap-around Mode, Resource Manager.

Demonstrate how these features enhance digital drawing and painting.

Explain the process of downloading Krita from the official website. Guide students through the installation process.

Demonstrate the welcome screen of Krita and explain the options available. Guide students on creating a new document and selecting the desired canvas size.

Explain and demonstrate the following components of the Krita Window:

- Title Bar
- Menu Bar
- Toolbar
- Toolbox
- Dockers
- Canvas

Demonstrate the use of different types of Graphics and Shapes tools and there steps available in Krita.

- Line Tool: A Line Tool is used to draw straight lines.
- Rectangle Tool: A Rectangle Tool is used to draw a rectangle or a square.
- Ellipse Tool: The Ellipse Tool is used to draw an ellipse or a circle.
- Polygon Tool: The Polygon Tool is used to draw a polygon.
- Fill Tool: The Fill Tool is used to fill areas with a solid color, gradient, or pattern.
- Text Tool: The Text Tool in Krita can help you add and customise text in your artwork.
- Brush Tool: The Brush tool used to create various artistic effects, such as drawing, painting, and shading.
- Erasing Tool: The erasing tool used to correct mistakes, refine artwork, or remove unwanted parts of a drawing.

Demonstrate how to save file and importance of saving work regularly.

Explain the process or steps of opening and closing files in Krita.

Ask the students to solve the exercise **I Know** given on page number 47.

Ask the students to solve the exercise **Quiz Bee** given on page number 59.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Krita used for?

Q. What are some unique features of Krita?

Q. How can you create a new document in Krita?

Q. What is the function of the Brush Stabilizer?

Q. What are the main components of the Krita window?

Q. How do you draw shapes in Krita?

Q. How do you save and open Krita files?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 61 and 62 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 63.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on pages 63 in the main course book. This will enhance the ability of the students and serve as a creativity activity.

Suggested Activity

Ask students to create a digital artwork using Krita and save it as a .png file.

5 Learn HTML5 and CSS3

Teaching Objectives

Students will learn about

- What Is HTML?
- History of HTML
- HTML Editor
- Features of HTML5
- Understanding HTML5 Tags
- Basic HTML Tags
- Attributes
- HTML Comments
- Rules for Writing HTML Codes

- Structure of an HTML Document
- Creating and Saving an HTML Document
- Displaying a Web Page in a Web Browser
- <P> Tag
-
 Tag
- <Hn> Tag
- <HR> Tag
- Styling HTML5 Documents with Cascading Style Sheets
- Use of Inline CSS with HTML5 Tags

Number of Periods	
Theory	Practical
2	4

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 64 to understand the recap of the topic.

While teaching this chapter, tell the students that websites consist of millions of pages called web pages which contain text, graphics, audios, videos and links to other pages.

Introduce Hypertext Markup Language (HTML) as language that describes the structure of a web page. Make the students understand the meaning of the terms like hypertext and markup language. Tell the students about the tools needed for working with HTML.

Make the students aware of the different types of HTML editors – WYSIWYG editor and Text editor.

Familiarise the students with basic HTML terms like tags, container tags, empty tags, block level tags, text level tags and attributes.

Tell the students about the concept of nesting of tags.

Share with the students the general rules followed for writing HTML codes.

Show to the students a HTML document and make them understand and identify the various sections and structure of the HTML document.

Demonstrate to the students the steps involved in:

- Creating a HTML document
- Saving a HTML document
- Previewing a web page.

Tell the students about the meaning and use of basic HTML tags covering <HTML>, <HEAD>, <TITLE> and <BODY> tags alone with their attributes.

Make the students aware of styling HTML5 Documents with cascading style sheets.

Let the students know how to use inline CSS with HTML5 tags.

Ask the students to solve the exercise **I Know** given on page number 67 and 74.

Ask the students to solve the exercise **Quiz Bee** given on page number 71.

Extension

Ask the students some oral questions based on this chapter.

Q. What is HTML?

Q. Define hypertext and Markup language.

Q. Name the different types of HTML editors.

Q. What are tags and attributes?

Q. State the rules followed while writing HTML codes.

Q. Name the text editor most commonly used to write HTML codes.

Q. What is the difference between container tags and empty tags?

Q. State the use of <HTML> / <HEAD> / <BODY> / <TITLE> tags.

Q. What are attributes?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 75, 76 and 77 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 page 78.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on pages 77 in the main course book. This will enhance the ability of the students and serve as an critical thinking and technology literacy activity.

Ask the students to try Self Reflection session given on page 74 to highlight elements like initiative and collaboration on part of the students.

Suggested Activity

Ask the students to develop a web page in HTML and show the names of National Symbols.

6 Formatting a Webpage

Teaching Objectives

Students will learn about

- Text Properties
- Background Properties
- Font Properties
- Margin Properties

Number of Periods	
Theory	Practical
2	3

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 82 to understand the recap of the topic.

Tell the students about HTML and attributes used in making web pages.

Introduce the students with the text properties and show them how to use these:

Property	Value	Description
color	Name of the colour	It specifies the text colour to be used on the web page.
text-align	left, right, center, justify	It specifies the alignment of the text.
text-indent	length in pixels or percentage	It specifies the indentation of the first line of the text.
text-decoration	underline, over line or strike-through	It specifies the text effects like underline, over line or strike-through.
text-transform	capitalise, uppercase, lower-case and none	It specifies the transformation of text into uppercase, lowercase or title case.

Also show them a code to use all these properties.

Demonstrate the students with the background properties and show them how to use these:

Property	Value	Description
background-color	Name of the colour	It specifies the background colour to be used on the web page.
background-image	URL of image	It specifies the image to be used in the background on the web page.
background-repeat	repeat, repeat-x, repeat-y, (whereas, x- horizontal & y-vertical) no repeat	It specifies the repetition of an image on the web page.

Also show them a code to use all these properties.

Make the students aware of the font properties and how they are used.

Demonstrate the students with the margin properties and show them how to use them with the help of a program.

Ask the students to solve the exercise **Quiz Bee** given on page number 84.

Ask the students to solve the exercise **I Know** given on page number 86.

Extension

Ask the students some oral questions based on this chapter.

Q. Define following text properties:

a. color
b. text-align
c. text-indent
d. text-decoration
e. text-transform

Q. Define the following background properties:

a. background-color
b. background-image
c. background-repeat

Q. Define the following font properties:

a. font-family
b. font-size
c. font-style

Q. Define margin properties.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 88, 89 and 90 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 94.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 90 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 90 in the computer lab to enhance media literacy skills.

Suggested Activity

Make a web page showing different types of food cuisine using the text and font properties taught in this chapter.

7 Introduction to Mobile Apps

Teaching Objectives

Students will learn about

- What are Apps?
- iOS and Android
- Features of Mobile Apps
- Types of Mobile Apps
- Categories of Apps

Number of Periods	
Theory	Practical
2	0

Teaching Plan

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

While teaching this chapter, brief the students about smartphones and technology.

Tell the students that an App is a software program primarily developed for hand-held smart devices such as mobile and tablet.

Explain to the students the difference between the Android and iOS in detail.

Make the students aware of the features of mobile apps.

Demonstrate the types of Mobile Apps to the students with example, that are:

- Native Apps
- Web Apps
- Hybrid Apps

Explain the following categories of Apps to the students along with the examples:

- Educational Apps
- Social Media Apps
- Entertainment Apps
- Communication Apps
- Lifestyle Apps
- Utility Apps
- Gaming Apps
- E-Commerce Apps

Ask the students to solve the exercise **Quiz Bee** given on page number 93.

Ask the students to solve the exercise **I Know** given on page number 94.

Extension

Ask the students some oral questions based on this chapter.

Q. What is an App?

Q. What is iOS?

Q. What is Android?

Q. What are the features of mobile apps?

Q. Name the types of mobile apps.

Q. Define the following:

- Gaming Apps
- Entertainment Apps
- Educational Apps
- Communication Apps
- Lifestyle Apps
- Utility Apps
- Social Media Apps
- E-Commerce Apps

Evaluation

After explaining the chapter, let the students do the exercises given on pages 96, 97 and 98 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 98.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 98 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 Self Reflection session given on page 95 to highlight elements like Leadership & responsibility on part of the students.

Suggested Activity

Ask the students to add text and convert it into an image in Adobe Animate 2021.

8 Internet Services

Teaching Objectives

Students will learn about

- Services on the Internet
- Safety on Internet

Number of Periods	
Theory	Practical
3	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 99 to understand the recap of the topic.

While teaching this chapter, brief the students about Internet.

Make the students aware of various services available on the internet for users.

Explain the Internet services like:

- Searching informations
- Video conferencing
- E-commerce
- Blog
- Instant messaging
- File sharing
- Internet banking
- Podcast

Let the students know about the safety on Internet.

Ask the students to solve the exercise **Quiz Bee** given on page number 102.

Ask the students to solve the exercise **I Know** given on page number 103.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Internet?

Q. How can we search for the information on the Internet?

Q. What is instant messaging?

Q. Name some applications used for instant messaging.

Q. What is video conferencing?

Q. What is file sharing?

Q. What is Google Drive?

Q. What is E-commerce?

Q. What is Internet banking?

Q What is a blog?

Q. What is a podcast?

Q. What can we do to maintain safety on Internet?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 104, 105 and 106 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 106.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 106 in the main course book. This will enhance the ability of the students and serve as a creativity and technology literacy activity.

Ask the students to try Video based question given on page 106 in the computer lab to enhance media literacy skills.

Suggested Activity

Ask the students to learn how to use the internet services.

9 Algorithm, Flowchart and Mind Maps

Teaching Objectives

Students will learn about

- Algorithm
- Writing an Algorithm
- Flowchart
- Drawing a Flowchart
- Brainstorming
- Mind Maps
- Computer Languages
- Language Translator

Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 108 to understand the recap of the topic.

Introduce algorithms as set of steps in a sequential and ordered manner to solve any problem or to complete a task.

Let the students know that writing a program becomes easy if the algorithm is written first.

Encourage the students to write algorithms involving some basic tasks like getting ready for school or involving mathematical problems.

Make the students aware of characteristics of an algorithm like input, output, definiteness, finiteness, effectiveness and uniqueness.

Explain to the students that an algorithm is mainly used for calculations, data processing and decision-making.

Let the students know how to write an algorithm.

Introduce flowcharts as diagrammatic representation of an algorithm.

Explain the shapes and usage of flowchart symbols covering Start / Stop box, Process box, Decision box, Input / Output box, Flow lines and Connectors.

Make the students learn the rules for drawing a flowchart.

Let the students know about advantages of a flowchart.

Encourage the students to draw flowcharts for the algorithms written earlier.

Explain to the students that brainstorming is a strategy to generate ideas. Brainstorming involves a group of people who sit together to discuss a topic and come up with ideas.

Make the students learn about Mind Maps and its structure.

Tell the students that computer languages are categorized as low-level languages (machine dependent) and high level languages (machine independent).

Share with the students that low level languages are further classified as machine language (first generation language made up of 0s and 1s) and assembly language (second generation language made up of alphanumeric symbols).

Make the students learn that the high level languages are further classified as third generation languages (examples: BASIC, FORTRAN, PASCAL, etc.), fourth generation languages (examples: SQL, Perl, Python, etc.) and natural language or fifth generation languages (Examples: Mercury, OPS5 and Prolog) involving artificial intelligence.

Tell the students the advantages and disadvantages of high level languages over low level languages.

Introduce the concept of language translators as software that convert a high level language into a machine language covering:

- Assembler – It is used to translate assembly language into machine language.
- Compiler – It is used to convert source program at once into machine language before executing it.
- Interpreter – It reads one line of instruction at a time and translates it into machine language before executing it.

Ask the students to solve the exercise **I Know** given on page number 110.

Ask the students to solve the exercise **Quiz Bee** given on page number 115.

Extension

Ask the students some oral questions based on this chapter.

Q. What is an algorithm?

Q. What is a flowchart?

Q. What is brainstorming?

Q. What is a mind map?

Q. What are computer languages?

Q. What is Low-Level language?

Q. What is High-Level language?

Q. Give examples of each:

a. Machine Language b. Assembly Language

c. Third Generation Language d. Fourth Generation Language

e. Fifth Generation Language

Q. What is a language translator?

Q. What is an assembler?

Q. What is the difference between a compiler and an interpreter?

Q. Explain the working of language translators.

Evaluation

After explaining the chapter, let the students do the exercises given on pages 116, 117 and 118 in the main course book in the form of Assess Yourself. Tell them to solve the Communication skill developing exercise as Coding Zone given on page 119.

Take the students to the computer lab and let them practise the activity given in the Lab Activity and Fun Activity section on page 118 and 119 in the main course book. This will enhance the ability of the students and serve as an interdisciplinary, technology literacy, creativity and critical thinking activity.

Suggested Activity

Ask the students to find some questions which can be solved using algorithm and flowchart. Also, ask the students to collect more information about the computer languages and translators.

10 Introduction to Python

Teaching Objectives

Students will learn about

- Python
- Getting Started with Python
- Programming Modes in Python
- Input and Output
- Variables in Python
- Data Types in Python
- Comments in Python
- Operators in Python
- Saving a Python Program
- Executing a Python Program
- Opening a Saved Python Program

- Exiting Python Idle
- 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 120 to understand the recap of the topic.

While teaching this chapter, tell the students that Python is a popular high-level programming language and it is a powerful language used for general-purpose programming.

Introduce the students with Python and its use.

Share with the students the features of Python briefly that it is:

- Easy to code • Open-source language
- Object-oriented • Integrated and Extensible language
- Interpreted language • Dynamically Typed language

Demonstrate to the students the steps to install Python.

Show to the students the components of IDLE Shell window.

Tell the students that Programming in Python has two basic modes:

- Script Mode
- Interactive Mode

Explain to the students the Input and Output functions in a Python program with syntax and pictures.

Let the students know that a variable is the name of the memory location that is used to store data values that can be accessed or changed later.

Explain to the students the data types in Python, they are into, float and string.

Make the students aware of comments and its types in Python.

Let the students that operators are the special symbols in python that are used to perform computations.

Explain to the students how to save a Python program.

Make the students aware of executing a program in Python.

Let the students know how to open a saved Python program.

Make the students aware of exiting Python IDLE.

Ask the students to solve the exercise **I Know** given on page number 124.

Ask the students to solve the exercise **Quiz Bee** given on page number 126.

Extension

Ask the students some oral questions based on this chapter.

Q. What is Python?

Q. What are features of Python?

Q. What are the steps to install Python?

Q. What are the two modes of programming in Python?

Q. What is the purpose of input() function?

Q. What is the purpose of print() function?

Q. What are variables in Python?

Q. What are comments in Python?

Q. What are operators in Python?

Evaluation

After explaining the chapter, let the students do the exercises given on pages 131 and 132 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 133.

Take the students to the computer lab and let them practise the activity given in the Lab Activity section on page 132 in the main course book. This will enhance the ability of the students and serve as a technology literacy activity.

Also ask the students to carry out Group Discussion session given on page 133 in the class to enhance social interaction and communication skills.

Suggested Activity

Ask the students to create a program in Python. Tell them to use all the functions taught in this chapter.

11 Intelligence and AI Approaches

Teaching Objectives

Students will learn about

- Intelligence
- Types of Intelligence
- Exploring Intelligence
- AI Approach

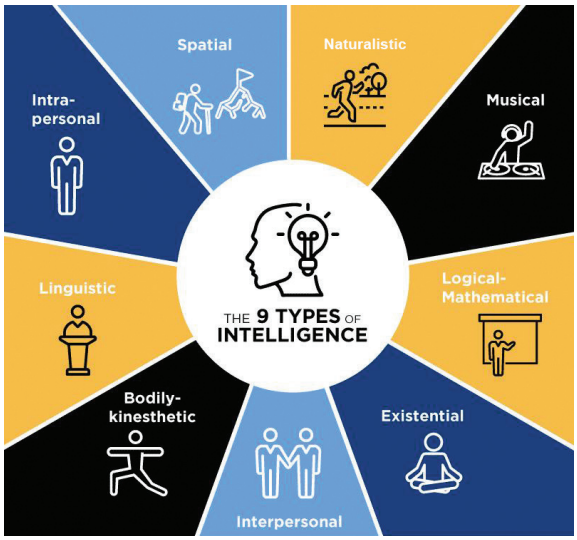
Number of Periods	
Theory	Practical
2	0

Teaching Plan

Before starting the chapter, ask the students to read the comic given on page 134 to understand the recap of the topic.

Define the meaning of Intelligence to the students.

Explain the types of Intelligence along with the qualities of the same to the students:



- Visual-Spatial Intelligence
- Verbal-Linguistic Intelligence
- - Logical-Mathematical Intelligence
- Bodily-Kinesthetic Intelligence
- Musical Intelligence
- Interpersonal Intelligence
- Existential Intelligence
- Intrapersonal Intelligence
- Naturalistic Intelligence

Make the students do some activities for exploring Intelligence.

Define the AI Approach which simulates human attribute:

- Rule Based Approach
- Learning Based Approach

Ask the students to solve the exercise **I Know** given on page number 136.

Ask the students to solve the exercise **Quiz Bee** given on page number 137.

Extension

Q. Define Intelligence.

Q. Define the qualities of these:

- Visual-Spatial Intelligence
- Verbal-Linguistic Intelligence
- Logical-Mathematical Intelligence
- Bodily-Kinesthetic Intelligence
- Musical Intelligence
- Interpersonal Intelligence
- Existential Intelligence
- Intrapersonal Intelligence
- Naturalistic Intelligence

Q. Define the two AI approaches:

- Rule Based Approach
- Learning Based Approach

Evaluation

After explaining the chapter, let the students do the exercises given on pages 138, 139 and 140 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 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 serve as a creativity, critical thinking and technology literacy activity.

Suggested Activity

Make a presentation showing different types of intelligence and their qualities.