LESSON PLAN

COMPUTER—A WONDER MACHINE
CLASS VII
Chapter 1: NUMBER SYSTEM – AN INTRODUCTION

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand what a Number System is.
- Explain why computers use Binary Language.
- Identify types of Number Systems – Decimal, Binary, Octal and Hexadecimal.
- Understand base and positional value concept.
- Convert Decimal to Binary using Repeated Division Method.
- Convert Binary to Decimal using Positional Method.
- Recognize real-life applications of number systems.

PERIOD 1: INTRODUCTION TO NUMBER SYSTEM and COMPUTER LANGUAGE

Previous Knowledge Testing (5 min)

- How do we talk to each other?
- What language do computers understand -- English or Hindi?

Content Explanation (25 min)

• Communication Language vs Computer Language
• A computer understands only Numbers
• Binary Language – 0 and 1
• Meaning of Number System
• Everyday examples – Mobile numbers, Roll numbers

Activity (10 min)

Students write their registration number and parents' mobile numbers and discuss why numbers are important.

Visual Aid (3 min)

Show keyboard and binary digits (0,1) chart.

Recapitulation (2 min)

- What language does a computer understand?
- What is a number system?

PERIOD 2: DECIMAL NUMBER SYSTEM

Previous Knowledge Testing (5 min)

- Which numbers do we use daily?

Content Explanation (25 min)

• Decimal Number System
• Base-10 concept
• Digits 0–9
• Positional Values – Ones, Tens, Hundreds, Thousands
• Example Breakdown (*e.g.,* 3456)

Activity (10 min)

Students perform 'Do It Yourself – Breakdown of Decimal Number' in the class.

Visual Aid (3 min)

Teacher draws place value chart on the board.

Recapitulation (2 min)

- What is the base of decimal system?
- Maximum digit in decimal?

PERIOD 3: BINARY NUMBER SYSTEM

Previous Knowledge Testing (5 min)

- Have you seen ON/OFF switches?

Content Explanation (25 min)

• Binary Number System – Base-2
• Digits – 0 and 1
• Bit Meaning
• Powers of 2
• 3-bit patterns (000–111)

Activity (10 min)

Students perform the given 'Do It Yourself' activity in the class.

Visual Aid (3 min)

Teacher draws the given Binary chart on the board.

Recapitulation (2 min)

- How many digits in binary?
- What is a bit?

PERIOD 4: OCTAL and HEXADECIMAL NUMBER SYSTEM

Previous Knowledge Testing (5 min)

- Can numbers use letters?

Content Explanation (25 min)

• Octal Number System – Base-8 (0–7)
• Hexadecimal Number System – Base-16 (0–9, A–F)
• Letter values A=10 to F=15
• Simple examples

Activity (10 min)

Students perform 'Do It Yourself' activity – Conversion of hexadecimal number to decimal number – in the class.

Visual Aid (3 min)

Comparison table of all number systems.

Recapitulation (2 min)

- Base of octal?
- Base of hexadecimal?

PERIOD 5: DECIMAL NUMBER TO BINARY NUMBER CONVERSION

Previous Knowledge Testing (5 min)

- What is division by 2?

Content Explanation (25 min)

• Repeated Division Method
• Step-by-step example
• Reading remainder bottom to top

Activity (10 min)

Students perform 'Do It Yourself' activity to convert 29_{10} to Binary in the class.

Visual Aid (3 min)

Present the solved examples on board provided in the chapter.

Recapitulation (2 min)

- Which method is used?
- Direction of remainder reading?

PERIOD 6: BINARY NUMBER TO DECIMAL NUMBER CONVERSION

Previous Knowledge Testing (5 min)

- What are the powers of 2?

Content Explanation (25 min)

• Positional Method
• Multiply digit with position value

• Add results
• Example conversion

Activity (10 min)

Students perform ‘Do It Yourself’ activity to convert $(1110)_2$ to decimal.

Visual Aid (3 min)

Teacher draws the provided position value table on the board.

Recapitulation (2 min)

- First position value?
- Final step in conversion?

LESSON PLAN

COMPUTER – A WONDER MACHINE
CLASS VII
Chapter 2: ADVANCED FEATURES OF EXCEL

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the need for advanced Excel features.
- Explain Sorting and its types – Ascending & Descending.
- Perform Single Column and Multi-Level Sorting.
- Understand the concept of Filtering Data.
- Apply Auto Filter and Multiple Filters. Also, how to remove filters using different options.
- Use Goal Seek feature to find input values.
- Understand the steps of Printing a Worksheet.

PERIOD 1: INTRODUCTION TO ADVANCED FEATURES and SORTING

Previous Knowledge Testing (5 min)

- Have you ever searched a name in a long list?
- Have you arranged names alphabetically?

Content Explanation (25 min)

• Need for Advanced Features in Excel
• Meaning of Sorting
• Types of Sorting:

- Ascending (A–Z)
- Descending (Z–A)
  • Steps to Sort a Single Column

Activity (10 min)

Students perform ‘Do It Yourself’ – Create a list of 10 classmates and practise A–Z and Z–A sorting.

Visual Aid (3 min)

Present the images given in the chapter.

Recapitulation (2 min)

- What is sorting?
- Name two types of sorting.

PERIOD 2: MULTI-LEVEL/CUSTOM SORT

Previous Knowledge Testing (5 min)

- Can we arrange marks and names together?

Content Explanation (25 min)

• Need for Sorting by more than One Column
• Custom Sort Option
• Add Level Feature
• Header Row Checkbox
• Examples – Name, Subject, Score

Activity (10 min)

Students to perform the given ‘Do It Yourself’ activity – create Student Grade Sheet and practise sorting by Subject then Marks. Later, students to perform it in the computer lab.

Visual Aid (3 min)

Present the screenshots provided in the chapter.

Recapitulation (2 min)

- What is multi-level sorting?

PERIOD 3: INTRODUCTION TO FILTERING DATA

Previous Knowledge Testing (5 min)

- How do you find only your marks from the class result?

Content Explanation (25 min)

• Meaning of Filtering
• Difference between Sorting & Filtering
• Auto Filter Concept
• Steps to Apply Filter
• Shortcut Key CTRL + SHIFT + L

Activity (10 min)

Discuss the given 'Do It Yourself' – Apply filters activity in the class and later students to perform it in the lab.

Visual Aid (3 min)

Show drop-down arrows in header row and other screenshots given in the chapter.

Recapitulation (2 min)

- What is filtering?

PERIOD 4: MULTIPLE FILTERS & REMOVING FILTERS

Previous Knowledge Testing (5 min)

- Can we search Maths marks above 80 only?

Content Explanation (25 min)

• Applying Multiple Filters
• Filter by Text/Number
• Removing Filters:

- Filter Button
- Clear Option
- Select All Checkbox

Activity (10 min)

Discuss 'Do It Yourself' activity – Applying Multiple Filters – and later implement it in the practical session.

Visual Aid (3 min)

Show students the filtering screenshots provided in the chapter.

Recapitulation (2 min)

- How do we remove filters?

PERIOD 5: GOAL SEEK FEATURE

Previous Knowledge Testing (5 min)

- If you know the total marks, can you find the missing marks?

Content Explanation (25 min)

• Meaning of Goal Seek
• When to use Goal Seek
• Steps to use Goal Seek feature
• Real-Life Examples – Interest, Sales Target

Activity (10 min)

Discuss 'Do It Yourself' activity – Practise Goal Seek – in the class. Later, students to perform it in the computer lab.

Visual Aid (3 min)

Present Goal Seek dialog box screenshot given in the chapter.

Recapitulation (2 min)

- What is Goal Seek used for?

PERIOD 6: PRINTING A WORKSHEET

Previous Knowledge Testing (5 min)

- Have you printed a project before?

Content Explanation (25 min)

• File Tab → Print Option
• Backstage View
• Print Settings:

- Number of Copies

- Orientation
- Margins
- Page Size
- Scaling
- Printer Selection

Activity (10 min)

Students practise ‘Do It Yourself’ activity – Different printing scenarios in the lab.

Visual Aid (3 min)

Show the images of Print Pane provided in the chapter.

Recapitulation (2 min)

- From where do we print a worksheet?

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LESSON PLAN

COMPUTER – A WONDER MACHINE
CLASS VII
Chapter 3: CHARTS IN EXCEL

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the meaning and need of Charts in Excel.
- Explain the advantages of representing data graphically.
- Identify components of a chart – Title, Axes, Data Series, Legends.
- Create different types of charts using Excel.
- Use Chart Design and Format tabs.
- Change chart type, layout and style.
- Switch Row and Column data.
- Modify Data Range of charts.
- Format chart background, colors and patterns.
- Move charts to another worksheet.

PERIOD 1: INTRODUCTION TO CHARTS and NEED FOR CHARTS

Previous Knowledge Testing (5 min)

- Have you seen graphs in newspapers or TV?
- Which is easier to understand — table or picture?

Content Explanation (25 min)

• Meaning of Charts or Graphs
• Why charts are used
• Advantages – Easy comparison, visual appeal, trend analysis
• Real-life examples – Marks, Attendance, Sports Scores

Activity (10 min)

Students perform ‘Do It Yourself’ activity – Collect simple class data (boys/girls, favourite subject) in the class.

Visual Aid (3 min)

Show sample bar or column chart on the board or on PPT.

Recapitulation (2 min)

- What is a chart?
- Why are charts useful?

PERIOD 2: COMPONENTS OF A CHART

Previous Knowledge Testing (5 min)

- Have you seen titles on graphs?

Content Explanation (25 min)

• Title
• Vertical Axis (Y-Axis / Value Axis)
• Horizontal Axis (X-Axis / Category Axis)
• Data Series
• Legends

Activity (10 min)

Students perform ‘Do It Yourself’ activity – Favourite fruit chart on paper with labels in the class.

Visual Aid (3 min)

Teacher draws labelled chart diagram on the board.

Recapitulation (2 min)

- Name any two components of a chart.

PERIOD 3: CREATING A CHART IN EXCEL

Previous Knowledge Testing (5 min)

- Have you inserted pictures in Word before?

Content Explanation (25 min)

• Collect Source Data
• Select Data Range
• Insert Tab → Charts Group
• Selecting Chart Category and Type
• Chart appears on sheet

Activity (10 min)

Students perform 'Do It Yourself' activity – To create a Column Chart of Student Scores in the class. Later, students will perform it in the computer lab.

Visual Aid (3 min)

Show students charts and screenshots on this topic provided in the book.

Recapitulation (2 min)

- Which tab is used to insert charts?

PERIOD 4: FORMATTING CHARTS

Previous Knowledge Testing (5 min)

- Can we change colours of a picture?

Content Explanation (25 min)

• Chart Design Tab Introduction
• Chart Layouts
• Chart Styles
• Change Chart Type
• Move Chart Option

Activity (10 min)

Discuss 'Do It Yourself' activity in the class and later students will implement it in the computer lab.

Visual Aid (3 min)

Teacher shows Chart Design ribbon as given in the chapter.

Recapitulation (2 min)

- Which option changes chart type?

PERIOD 5: SWITCH ROW/COLUMN and DATA RANGE

Previous Knowledge Testing (5 min)

- Can we rearrange table rows and columns?

Content Explanation (25 min)

• Switch Row/Column Feature
• Select Data Option
• Updating Chart with New Data
• Understanding Source Data

Activity (10 min)

Discuss 'Do It Yourself' activities in the class and later students perform it in the computer lab.

Visual Aid (3 min)

Present the images and screenshots provided in the chapter.

Recapitulation (2 min)

- What happens when we switch row and column?

PERIOD 6: FORMAT TAB – BACKGROUND, COLORS & PATTERNS

Previous Knowledge Testing (5 min)

- How do we decorate charts and posters?

Content Explanation (25 min)

• Format Tab Introduction
• Changing Background
• Solid Fill, Gradient Fill, Pattern Fill, etc
• Changing Colors
• Formatting Data Series and Axis

Activity (10 min)

Discuss ‘Do It Yourself’ activities given in the chapter and later students to implement them in the computer lab.

Visual Aid (3 min)

Teacher shows the screenshots and images provided in the chapter.

Recapitulation (2 min)

- Which tab is used for formatting charts?

PERIOD 7: MOVING CHART

Previous Knowledge Testing (5 min)

- Can we move pictures between pages?

Content Explanation (25 min)

• Move Chart Option
• New Worksheet for Charts
• Organizing Workbook

Activity (10 min)

Students perform the already discussed ‘Do It Yourself’ activities in the lab.

Visual Aid (3 min)

Present the images and draw the steps on the board.

Recapitulation (2 min)

- What is Move Chart used for?

LESSON PLAN

COMPUTER—A WONDER MACHINE
CLASS: VII
Chapter 4: INTERNET – HTML

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the meaning of Internet, Website and Web Page.
- Explain URL, Home Page and Web Browser.
- Differentiate between Client and Server.
- Understand HTML and its features.
- Identify Tags and Types of Tags (Paired & Unpaired).
- Explain Structure of an HTML Document.
- Create and view a simple HTML Web Page.
- Use Basic HTML Tags like <HTML>, <HEAD>, <TITLE>, <BODY>.
- Apply Formatting Tags – Bold, Italic, Underline, Superscript, Subscript.
- Understand Heading, Paragraph and Line Break Tags.
- Get introduction to CSS Styling.
- Identify Web Browsers and HTML Editors.

PERIOD 1: INTRODUCTION TO INTERNET, WEBSITE and WEB PAGE

Previous Knowledge Testing (5 min)

- Do you use the internet at home or school?
- Name any website you know.

Content Explanation (25 min)

• Meaning of Internet – Network of Networks
• Website and Web Page
• Home Page
• URL (Uniform Resource Locator)
• Types of Content – Text, Images, Videos, Links

Activity (10 min)

Students perform 'Do It Yourself' activity – Open a favourite website and identify Home Page and URL in the lab.

Visual Aid (3 min)

Teacher shows example of a website on the projector.

Recapitulation (2 min)

- What is a website?
- What is URL?

PERIOD 2: WEB BROWSERS and CLIENT–SERVER CONCEPT

Previous Knowledge Testing (5 min)

- Which browser do you use?

Content Explanation (25 min)

• Meaning of Web Browser
• Examples – Chrome, Edge, Firefox, Safari
• Client and Server Concept (Real-life examples)
• HTTP Protocol

Activity (10 min)

Students perform 'Do It Yourself' activity – List five client–server examples from daily life.

Visual Aid (3 min)

Browser window demonstration via projector.

Recapitulation (2 min)

- Who is a client?
- Name two browsers.

PERIOD 3: INTRODUCTION TO HTML and ITS FEATURES

Previous Knowledge Testing (2.5 min)

- Have you ever seen source code of a website?

Content Explanation (30 min)

• Full Form of HTML
• Need for HTML
• Features – Hyperlinks, Formatting, Easy Navigation
• Concept of Syntax

Visual Aid (10 min)

Teacher shows sample HTML code.

Recapitulation (2.5 min)

- What does HTML stand for?

PERIOD 4: TAGS and STRUCTURE OF HTML DOCUMENT

Previous Knowledge Testing (5 min)

- What is grammar in language?

Content Explanation (25 min)

• Meaning of Tags, Angular Brackets
• Structure – <HTML>, <HEAD>, <TITLE>, <BODY>
• Types of Tags: Paired Tags vs Unpaired Tags

- Create and View HTML document

Activity (10 min)

Students perform 'Do It Yourself' activity in the class.

Visual Aid (3 min)

Teacher draws the board diagram of HTML structure.

Recapitulation (2 min)

- Name two paired tags.

PERIOD 5: BASIC and FORMATTING HTML TAGS

Previous Knowledge Testing (5 min)

- How do we make text bold in Word?

Content Explanation (25 min)

• Basic HTML tags

- Attributes of <BODY> tag
- <P>,
 Tags
  - <B>, <I>, <U>
  - <SUP>, <SUB>

Activity (10 min)

Discuss 'Do It Yourself' activities in the class and later students to either implement them in the lab or assigned as homework.

Visual Aid (3 min)

Show students the relative codes provided in the chapter.

Recapitulation (2 min)

- Identify paired and unpaired tags.

PERIOD 6: HEADING TAG and CSS INTRODUCTION

Previous Knowledge Testing (5 min)

- Have you seen big and small headings?

Content Explanation (25 min)

• <H1> to <H6> Tags
• Introduction to CSS
• <STYLE> Tag
• Text Align and Colors

Activity (10 min)

Discuss the given ‘Do It Yourself’ activity in the class and later students to practise them on the computer.

Visual Aid (3 min)

Present the code along with the output on the board.

Recapitulation (2 min)

- How many heading levels are there?

PERIOD 7: WEB BROWSERS, HTML EDITORS

Previous Knowledge Testing (5 min)

Rapid oral quiz.

Content Explanation (25 min)

• HTML Editors – Notepad, Coffeecup
• Viewing Source Code
• Browser Components

Activity (10 min)

Students perform Exploring Browers and Editors – ‘Do It Yourself’ activities – in the lab or assign them as assignment after discussing them in the class.

Visual Aid (3 min)

Present HTML codes provided in the book.

Recapitulation (2 min)

- Name two HTML tags.
- What is CSS used for?

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LESSON PLAN

COMPUTER – A WONDER MACHINE
CLASS VII
Chapter 5: THE WORLD OF CANVA

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the meaning and purpose of Canva.
- Explain why Canva is useful for students.
- Create a Canva account and log in.
- Identify the Canva Dashboard and its Panes and also understand different Design Types in Canva.
- Create simple Poster, Presentation and Document by applying Basic Design Elements – Colors, Text, Images and Layout.
- Use Text Formatting and Effects. Also, understand Color Theory Basics.
- Work with Images and Editing Tools and create projects like Video and Website.

PERIOD 1: INTRODUCTION TO CANVA and ITS USES

Previous Knowledge Testing (5 min)

- Have you ever made a poster or a chart?
- What do you like -- drawing or designing?

Content Explanation (25 min)

• What is Canva?
• Canva as a Digital Art Studio
• Why Canva is Useful
• Real-life uses – Posters, Projects, Presentations

Activity (10 min)

Students perform ‘Do It Yourself’ activity – Think about Design – in the class.

Visual Aid (3 min)

Show Canva posters or school designs.

Recapitulation (2 min)

- What is Canva?
- Name one use of Canva.

PERIOD 2: GETTING STARTED WITH CANVA – ACCOUNT and DASHBOARD

Previous Knowledge Testing (2.5 min)

- Have you ever created an email or app account?

Content Explanation (25 min)

• Steps to Create Canva Account
• Login Methods – Google / Email
• Canva Interface – Dashboard Overview
• Three Panes – Top, Left and Center

Visual Aid (15 min)

Teacher shows Canva dashboard on projector.

Recapitulation (2.5 min)

- Name any two panes of Canva dashboard.

PERIOD 3: UNDERSTANDING DESIGN TYPES

Previous Knowledge Testing (2.5 min)

- What types of projects do you make in school?

Content Explanation (25 min)

• Presentation
• Poster
• Flyer
• Infographic

• Document
• Sheet
• Video
• Website

Visual Aid (15 min)

Show icons of different design types on the board or via projector.

Recapitulation (2.5 min)

- Which design type is used for slides?

PERIOD 4: CREATING FIRST POSTER DESIGN with BASIC DESIGN ELEMENTS

Previous Knowledge Testing (5 min)

- Have you designed a birthday card?

Content Explanation (25 min)

• Detailed explanation of creating a poster design

- Basic Design Elements

Activity (10 min)

Students perform 'Do It Yourself' activity in the class.

Visual Aid (3 min)

Show students the images and screenshots provided in the book.

Recapitulation (2 min)

- Which option is used to start a new design?

PERIOD 5: TEXT FORMATTING

Previous Knowledge Testing (2.5 min)

- Why do we use different colors and fonts?

Content Explanation (25 min)

• Font Families – Serif, Sans-Serif, Decorative
• Text Effects – Bold, Italic, Underlined, Shadow, Outline
• Text Spacing and Alignment

Visual Aid (15 min)

Teacher shows font styles, effects and spacing.

Recapitulation (2.5 min)

- Name two text effects.

PERIOD 6: COLORS and WORKING WITH IMAGES

Previous Knowledge Testing (2.5 min)

- Which colors do you like the most?

Content Explanation (25 min)

• Primary, Secondary and Complementary Colors
• Color Emotions
• Changing Backgrounds
• Image Sources – Free Photos, Graphics/Icons and Uploads
• Image Editing Tools – Crop, Filters, Brightness, Contrast, Transparency

Visual Aid (15 min)

Teacher shows before/after image editing via projector or in the lab.

Recapitulation (2.5 min)

- What does the crop tool do?

PERIOD 7: CREATING DIFFERENT PROJECT TYPES

Previous Knowledge Testing (2.5 min)

- Have you made PPT or Word projects?

Content Explanation (25 min)

• Creating Presentation
• Creating Sheet (Planner)

• Creating Document
• Using Whiteboard
• Creating Video
• Building Website

Visual Aid (15 min)

Teacher to show a demo via projector or in the lab.

Recapitulation (2.5 min)

- Which tool is used for mind maps?

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LESSON PLAN

SUBJECT: Computer
CLASS VII
CHAPTER 6: Database and DBMS — An Introduction

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the meaning of database and DBMS.
- Explain the advantages and uses of databases.
- Understand the Relational Data Model.
- Identify components of MS Access 365.
- Understand tables, fields, records and data items.
- Explain the concept of Primary Key and Foreign Key.
- Understand data types in Access.
- Create tables using Design View and Datasheet View.
- Understand relationships between tables.
- Create and use queries in Access.

PERIOD 1: INTRODUCTION TO DATABASE AND DBMS

Previous Knowledge Testing (5 min)

- How do we store information in a computer?
- Where do we keep information like student details or marks?
- Have you heard the word database before?

Content Explanation (25 min)

- Explain the concept of Database as an organized collection of related data.
- Give simple real-life examples:

    - School records
    - Library records
    - Bank accounts
- Explain DBMS (Database Management System):
    - Software used to manage databases.
    - Examples: Microsoft Access, Oracle, SQL.
- Advantages of DBMS
    - Eliminates data redundancy
    - Maintains data consistency
    - Allows data sharing
    - Provides data security
    - Improves data integrity
- Uses of Database
    - Storing large information
    - Searching data quickly
    - Updating records easily
    - Sharing data among users
    - Keeping data safe and secure

Activity (10 min)

Students to perform 'Do It Yourself' – identify three places where databases are used in daily life in the class.

Visual Aid (2 min)

Show examples such as Train ticket booking system, Movie ticket booking seat selection provided in the chapter.

Recapitulation (3 min)

- What is a database?
- What is DBMS?

PERIOD 2: DATABASE MODELS AND INTRODUCTION TO ACCESS 365

Previous Knowledge Testing (5 min)

- What software do we use to store data in tables?
- Have you seen tables in Excel?

Content Explanation (30 min)

Explain Types of Data Models:

- Relational Data Model
- Hierarchical Data Model
- Network Data Model

Focus on Relational Data Model:

- Data organized in tables
- Tables connected using relationships

Explain MS Access 365:

- An RDBMS developed by Microsoft
- Database file extension: .ACCDB

Explain Objects of Access Database

- Tables
- Queries
- Forms
- Reports

Explain Database Designing Steps

1. Purpose of database
2. Fields
3. Tables
4. Primary key
5. Relationships
6. Design review

Activity (5 min)

Students perform ‘Do It Yourself’ to create a simple Class Database. Discuss the answers in the class. Teacher also to explain ‘Do It Yourself’ to create first database. Later, students to perform it practically in the computer lab.

Visual Aid (3 min)

Show the Access Backstage View screenshots from the chapter.

Recapitulation (2 min)

- What is RDBMS?
- Name the objects of an Access database.

PERIOD 3: COMPONENTS OF ACCESS AND TABLE STRUCTURE

Previous Knowledge Testing (5 min)

- What is a table in a computer?
- What do rows and columns represent?

Content Explanation (25 min)

Explain Components of Access 365:

- Ribbon
- Quick Access Toolbar
- Navigation Pane

Explain Table Structure

- Fields – columns
- Records – rows
- Data Items – values in cells

Explain Primary Key

- Field that uniquely identifies a record
- Cannot contain duplicate or null values

Example: Roll Number in a student table.

Activity (10 min)

Teacher to explain ‘Do It Yourself’ – a sample Student Table – and ask:

- How many fields are there?
- How many records are there?
- Which field should be the primary key?

Visual Aid (3 min)

Display screenshots and a table diagram showing fields, records and data items provided in the chapter.

Recapitulation (2 min)

- What is a field?
- What is a primary key?

PERIOD 4: DATA TYPES AND CREATING TABLES

Previous Knowledge Testing (5 min)

- What type of data can be stored in a table?
- Can numbers and text be stored together?

Content Explanation (25 min)

Explain Data Types in Access:

- Short Text
- Long Text
- Number
- Date/Time
- Currency
- AutoNumber
- Yes/No
- Attachment
- Hyperlink, etc.

Explain Ways to Create Tables

1. Design View

2. Datasheet View
3. Quick Start Fields

Explain Steps to create a table in Design View

- Enter Field Name
- Select Data Type
- Add Description
- Set Primary Key

Activity (10 min)

Teacher to explain 'Do It Yourself' – Choose the best data type – in the class. Also to explain– 'How to create a table My_Friends in Design View' and show how to manage data in a table. Later, students to do it practically in the lab.

Visual Aid (3 min)

Show screenshot of MS Access provided in the chapter.

Recapitulation (2 min)

- Name two data types in Access.
- Which view is used to design table structure?

PERIOD 5: RELATIONSHIPS IN DATABASE

Previous Knowledge Testing (5 min)

- Can two tables be connected together?
- Why would we connect tables?

Content Explanation (30 min)

Explain Relationships in Access

Definition:
Connecting tables using a common field so that related information can be stored and retrieved efficiently.

Explain Primary Key and Foreign Key

- Primary Key: A field that uniquely identifies each record in a table.

- Foreign Key: A field in one table that refers to the primary key of another table.

Explain Types of Relationships

- One-to-One Relationship
  One record in a table is related to only one record in another table.
- One-to-Many Relationship
  One record in a table is related to many records in another table.
- Many-to-Many Relationship
  Many records in one table are related to many records in another table.

Explain Referential Integrity

- Ensures consistency between related tables.
- Prevents deletion or modification of records that would break relationships between tables.

Activity (5 min)

Students to perform 'Do It Yourself' – Relationships activity from the chapter.

Teacher asks students to identify examples such as:

- One teacher teaches many students.
- One student has one student ID.
- Many students study many subjects.

Visual Aid (3 min)

Teacher shows screenshots/diagrams of table Relationships provided in the chapter.

Recapitulation (2 min)

- What is a relationship in a database?
- What is the difference between a primary key and a foreign key?

PERIOD 6: QUERIES IN ACCESS

Previous Knowledge Testing (2 min)

- How can we find specific information from a large table of data?
- Have you ever searched for something using filters?

Content Explanation (28 min)

Explain Queries

Queries are used to view, retrieve, change and analyze data from one or more tables.

Purpose of Queries

- Retrieve data
- Filter records
- Analyze information

Types of Queries

- Simple Query – retrieves data from one or more tables.
- Crosstab Query – summarizes data and performs calculations.
- Find Duplicates Query – identifies duplicate records.
- Find Unmatched Query – finds records that do not match with related tables.

Creating Query using Query Wizard

Steps:

1. Select the table.
2. Choose the required fields.
3. Select detail or summary option.
4. Give a name to the query.
5. Click Finish to create the query.

Queries in Design View

Teacher explains how queries can also be created in Design View by:

- Selecting fields
- Setting sorting order
- Applying criteria to filter data

Activity (10 min)

Teacher to explain the following ‘Do It Yourself’ activities:

- Creating a Simple Query using Query Wizard
- Creating queries in Design View

- Creating queries with specific criteria
- Advanced Query Challenge

Students to perform these activities later in the computer lab.

Visual Aid (3 min)

Teacher to show screenshots of Query Wizard and Query Design View from the chapter.

Recapitulation (2 min)

- What is a query?
- Why are queries useful in databases?

LESSON PLAN

SUBJECT: COMPUTER – A WONDER MACHINE
CLASS VII
Chapter 7: PROGRAM CODING

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the meaning of a computer program and programming language.
- Explain the activities involved in programming.
- Identify the components of a program such as identifiers, literals, data types and variables.
- Understand different types of operators used in programming.
- Explain loops and decision-making techniques used in programs.
- Understand the concept of functions and their advantages.
- Explain the concepts of events and event handlers.
- Understand collections and arrays used for storing multiple data items.
- Understand the steps involved in designing a computer program.

PERIOD 1: INTRODUCTION TO COMPUTER PROGRAMS AND PROGRAMMING LANGUAGES

Previous Knowledge Testing (5 min)

- What instructions do we give to a computer to perform tasks?
- Have you heard the word coding? What do you think it means?
- Can computers understand human language directly?

Content Explanation (25 min)

- Meaning of Computer Program – A sequence of instructions given to the computer to perform a task.

- Meaning of Programming Language – Special language used to communicate with computers.
    - Examples of programming languages: BASIC, C, C++, Java, Python
- Meaning of Computer Programming / Coding.
- Explain Activities involved in Programming:
- Explain Uses of Computer Programs in different fields:

Activity (10 min)

Students perform 'Do It Yourself' – Identify 10 devices at home that contain computer programs. Also discuss how these devices work automatically. Students also perform 'Do It Yourself' – Investigate Programming in different fields.

Visual Aid (3 min)

Show images of smart home devices and automated machines.

Recapitulation (2 min)

- What is a computer program?
- Name two programming languages.

PERIOD 2: COMPONENTS OF A PROGRAM

Previous Knowledge Testing (2 min)

- What is a variable in mathematics?
- Why do we give names to objects or places?

Content Explanation (25 min)

Explain components of a program:

1. Identifiers
    - Names given to variables, functions or objects.
    - Rules for naming identifiers.

    Examples:

- Valid identifiers: Age, student_name, TotalMarks
- Invalid identifiers: 2name, class, new-folder

2. Literals

- Fixed values that do not change during program execution.

Types of literals:

- Boolean (True / False)
- Integer (10, 25)
- Floating (4.5, 7.8)
- Character ('A')
- String ("Computer")

3. Data Types

Explain fundamental data types:

- Integer
- Float
- Character
- String
- Boolean

Explain why data types are important in programming.

4. Variables

- Memory locations used to store values.
- Steps:

  Declaration
  Initialization

Example:

Age = 13
Name = "Riya"

Activity (15 min)

Students to perform 'Do It Yourself' – Practise creating valid identifiers names, Classification Challenge and Match real-world information with appropriate data types in the class.

Recapitulation (3 min)

- What is an identifier?

- What is a variable?

PERIOD 3: OPERATORS IN PROGRAMMING

Previous Knowledge Testing (3 min)

- What mathematical operations do we use in daily life?
- Which symbol is used for addition?

Content Explanation (25 min)

- Explain Operators, operands and their role in programming.
- Types of Operators:
    - Arithmetic Operators: Addition (+), Subtraction (-), Multiplication (*), Division (/), Modulus (%)
    - Example calculations.
    - Relational Operators –Used for comparison: <, <=, ==, > , >=, !=, Result is True or False.
    - Logical Operators: OR, AND, NOT, explain using simple real-life conditions.
    - Assignment Operator: Used to assign value to a variable. Example:
      X = 10
      X = X + 1

Activity (15 min)

Teacher to explain 'Do It Yourself' – Arithmetic Operator Calculator, Logical Thinking Challenge, Assignment Operator Practice. Students to perform in the class as well as home assignment.

Recapitulation (2 min)

- What does the modulus operator do?
- What type of result do relational operators produce?

PERIOD 4: LOOPS AND DECISION-MAKING

Previous Knowledge Testing (5 min)

- What does repetition mean?

- Have you ever repeated a task many times?

Content Explanation (25 min)

Explain Looping (Iteration) – repeating a set of instructions.

Types of loops:

while Loop: Runs while the condition is true.

for Loop: Used for repeating instructions for a fixed number of times.

Examples:

Explain Decision-Making Techniques

if Statement: Executes instructions if condition is true.

if–else Statement: Provides two choices depending on condition.

if–elif–else Ladder: Used for multiple conditions.

Examples: Checking marks, Checking positive or negative numbers

Activity (10 min)

Teacher to explain 'Do It Yourself' – Loop Logic Explorer – and later students to perform it in the lab.

Visual Aid (3 min)

- Teacher to show examples and flowcharts provided in the chapter.

Recapitulation (2 min)

- What is a loop?
- Name two types of loops.

PERIOD 5: FUNCTIONS, EVENTS, COLLECTIONS AND PROGRAM DESIGN

Previous Knowledge Testing (3 min)

- What happens when we click a button on a computer screen?
- Why do we repeat the same steps while solving problems?

Content Explanation (30 min)

- Functions: A function is a set of instructions grouped together to perform a task.
- Advantages: Improves readability, Saves time, Reduces Code Length, Reusability

- Example: addTwoNumbers(5,3)
- Explain Function Parameters
- Events and Event Handlers
- Event – something that happens
- Examples: Mouse click, Keyboard press, Screen touch
- Event Handler – code that runs when the event happens
- Collections: Container that stores multiple items
- Examples: Phone contacts, school attendance list
- Arrays: Special collection storing same type of data. Elements are stored using index numbers starting from 0.
- Example: arr = [10,20,30,40]
- Limitations of Arrays
- Explain Designing a Program – Steps:

    1. Define problem
    2. Plan solution
    3. Create algorithm/flowchart
    4. Write code
    5. Test and debug
    6. Implement program
    7. Maintain program

Activity (10 min)

Students perform 'Do It Yourself' – identify events and event handlers and Arrays activities.

Recapitulation (2 min)

- What is a function?
- What is an event handler?
- What is an array?

LESSON PLAN

COMPUTER – A WONDER MACHINE

CLASS: VII

Chapter 8: More About Python

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand Python as a general-purpose programming language.
- Explain Python syntax and ways to execute Python programs.
- Understand the concept of indentation in Python.
- Explain the use of comments in Python programs.
- Understand variables and rules for naming variables.
- Identify different data types used in Python.
- Understand different types of Python operators and their uses.

PERIOD 1: INTRODUCTION TO PYTHON AND PYTHON SYNTAX

Previous Knowledge Testing (5 min)

- What is Python?
- Have you seen or used any programming language?
- Why do we use programming languages?

Content Explanation (25 min)

- Python as a general-purpose programming language.
- Python is simple, flexible and easy to understand.
- Python is used to build:
    - Desktop applications
    - Web applications
    - Mobile applications

Explain Python Syntax and program execution methods:

1. Running commands in Python Shell window.
2. Writing programs in Python Editor window and running using F5 / Run Module.

Example program:

print("Hello, World!")

Activity (10 min)

Teacher to explain 'Do It Yourself' activity:

Students will:

- Open Python Shell
- Type print("Hello, World!")
- Press Enter and observe the output.

Students then create a file hello.py and run it in the computer lab.

Visual Aid (2 min)

Show screenshot of Python Shell and Python Editor window.

Recapitulation (3 min)

- What is Python?
- Name two ways to execute Python code.

PERIOD 2: PYTHON INDENTATION AND COMMENTS

Previous Knowledge Testing (5 min)

- What happens if instructions are written incorrectly in a program?
- Why should programs be easy to read?

Content Explanation (25 min)

Explain Python Indentation:

- Indentation means leaving spaces before starting a line of code.
- It helps to organise the code and makes it readable.
- Incorrect indentation results in errors.

Example:

```
if 5 > 3:
  print("Five is greater than three")
```

Explain Python Comments:

- Comments are notes written by programmers.
- They help explain the program.
- The compiler ignores comments.

Syntax:

```
# This is a comment
```

Activity (10 min)

Students to perform 'Do It Yourself' – Correct Indentation – in the class and also write a simple program about themselves using comments.

Visual Aid (3 min)

Show examples of correct and incorrect indentation.

Recapitulation (2 min)

- What is indentation?
- What symbol is used for comments in Python?

PERIOD 3: VARIABLES IN PYTHON

Previous Knowledge Testing (5 min)

- What do we store in computer memory?
- Can programs store information such as name or age?

Content Explanation (25 min)

Explain Variables in Python:

- Variables are memory locations used to store values.
- Python does not require declaration of variables.

Example:

```
x = 14
```

Explain rules for naming variables:

- Must start with a letter or underscore.
- Cannot start with a digit.
- Can contain letters, numbers and underscore.
- Variable names are case-sensitive.

Activity (10 min)

Students to perform 'Do It Yourself' – To create variables for a student profile – in the class. Later, execute them in the lab.

Visual Aid (3 min)

Present screenshots provided in the chapter.

Recapitulation (2 min)

- What is a variable?
- Name one rule for variable naming.

PERIOD 4: DATA TYPES IN PYTHON

Previous Knowledge Testing (5 min)

- What type of data can computers store?
- Is a number different from text?

Content Explanation (30 min)

Explain Data Types in Python:

1. Text Type – str
2. Numeric Types – int, float, complex
3. Sequence Types – list, tuple, range
4. Mapping Type – dict
5. Set Type – set
6. Boolean Type – bool
7. Binary Types – bytes, bytearray, memoryview

Explain that string values are written in single or double quotation marks.

Activity (5 min)

Students to perform 'Do It Yourself' – Create variables with different data types – in the class.

Visual Aid (3 min)

Show table of Python data types.

Recapitulation (2 min)

- What is a data type?
- Give one example of numeric data type.

PERIOD 5: INTRODUCTION TO PYTHON OPERATORS

Previous Knowledge Testing (5 min)

- What do we use to perform calculations in mathematics?
- Have you seen symbols like **+** or **–** in programs?

Content Explanation (25 min)

Explain Python Operators

Operators are symbols used to perform operations on variables and values in Python.

Types of Python Operators

1. Arithmetic Operators
   Used to perform mathematical calculations.

Operators:

- , - , * , / , % , ** , //

Example:

```
num1 = 15
num2 = 4
print(num1 + num2)
```

Explain briefly:

- + Addition

- – Subtraction
- * Multiplication
- / Division
- % Modulus (remainder)
- ** Exponent (power)
- // Floor division

2. Assignment Operators

Used to assign values to variables.

Examples:

- =
- +=
- -=

Example:

```
x = 10
x += 5
print(x)
```

3. Comparison Operators

Used to compare two values and return True or False.

Operators:

== , != , > , < , >= , <=

Example:

```
a = 10
b = 5
print(a > b)
```

Activity (10 min)

Students to perform 'Do It Yourself' activities:

- Create a simple calculator program using arithmetic operators.
- Use assignment operators to update values.

Students to later perform these activities in the computer lab.

Visual Aid (3 min)

Teacher shows operator tables and examples provided in the chapter.

Recapitulation (2 min)

- What are operators?
- Name two arithmetic operators.

PERIOD 6: ADVANCED PYTHON OPERATORS

Previous Knowledge Testing (3 min)

- What happens when we compare two numbers in a program?
- What type of result do comparison operators give?

Content Explanation (25 min)

Logical Operators

Used to combine conditions.

Operators:

- and
- or
- not

Example:

```
age = 12
print(age > 10 and age < 18)
```

Identity Operators

Used to check whether two variables refer to the same object.

Operators:

- is
- is not

Example:

```
x = 5
y = 5
print(x is y)
```

Membership Operators

Used to check if a value exists in a sequence such as a list or string.

Operators:

- in
- not in

Example:

```
subjects = ["Math", "Science", "English"]
print("Math" in subjects)
```

Bitwise Operators (Brief Introduction)

Used to perform operations on binary numbers.

Explain briefly that they work at bit level and are used in advanced programming.

Activity (10 min)

Students perform 'Do It Yourself' activities:

- Compare test scores using comparison operators.
- Check student eligibility for activities using logical operators.
- Explore identity operators.
- Check whether subjects are present in the curriculum using membership operators.

Students will perform these activities in the computer lab and also complete them as a home assignment.

Visual Aid (5 min)

Teacher shows tables and screenshots of operator examples from the chapter.

Recapitulation (2 min)

- What are logical operators?
- Name two types of Python operators.

LESSON PLAN

COMPUTER – A WONDER MACHINE
CLASS VII
Chapter 9: TYPES OF ARTIFICIAL INTELLIGENCE

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the meaning of Artificial Intelligence.
- Identify the different types of AI based on capabilities.
- Differentiate between Weak AI and Strong AI.
- Recognize examples of Weak AI used in daily life.
- Understand the types of AI based on functionality.
- Explain Reactive Machines, Limited-Memory Machines, Theory-of-Mind Machines and Self-Aware Machines.
- Identify real-life and fictional examples of different AI types.
- Develop curiosity about the future possibilities of Artificial Intelligence.

PERIOD 1: INTRODUCTION TO TYPES OF ARTIFICIAL INTELLIGENCE

Previous Knowledge Testing (5 min)

- What is Artificial Intelligence?
- Can machines perform tasks like humans?
- Can you name any AI device or application you use?

Content Explanation (25 min)

- Brief recap of Artificial Intelligence.
- Explain that AI can be classified based on two factors:

    - Complexity or Capabilities
    - Functionality
- Introduce AI based on capabilities.
- Explain Weak AI (Narrow AI):
    - Designed to perform a specific task.
    - Follows human commands and rules.
    - Exists widely today.

Examples:

- Voice assistants
- Email spam filters
- Self-driving car systems
- Chess-playing programs

Activity (10 min)

Students perform 'Do It Yourself' Activity: List 10 AI tools or apps they know about (*e.g.*, Google Maps, Netflix recommendations, voice assistants).

Visual Aid (2 min)

Show images or screenshots provided in the chapter.

Recapitulation (3 min)

- What is Weak AI?
- Give one example of Weak AI.

PERIOD 2: STRONG AI AND DIFFERENCE BETWEEN WEAK AI AND STRONG AI

Previous Knowledge Testing (5 min)

- Can machines think like humans?
- Can a calculator write a story or play games?

Content Explanation (30 min)

Explain Strong AI (Artificial General Intelligence):

- Machines capable of performing any intellectual task a human can do.
- Can learn, understand, reason and make decisions.
- Still under development.

Explain characteristics of Strong AI:

- Learns from experience
- Makes independent decisions
- Can understand and interact socially

Discuss fictional examples:

- HAL 9000
- WALL-E
- JARVIS
- Data from Star Trek

Explain the difference between Weak AI and Strong AI using comparison table.

Activity (5 min)

Students perform 'Do It Yourself' – AI Sorting Challenge in the class.

Visual Aid (3 min)

Show a comparison table of Weak AI vs Strong AI provided in the chapter.

Recapitulation (2 min)

- What is Strong AI?
- Name one fictional example.

PERIOD 3: TYPES OF AI BASED ON FUNCTIONALITY

Time: 45 minutes

Previous Knowledge Testing (5 min)

- Do computers remember past information?
- Can machines learn from experience?

Content Explanation (25 min)

Explain AI based on functionality:

1. Reactive Machines

- Simplest form of AI
- Respond only to present situations
- Do not remember past data

Example: Chess-playing programs

2. Limited-Memory Machines

- Store information for a short time
- Use past data to improve performance

Example: Self-driving cars that track traffic, speed and distance.

Activity (10 min)

Teacher shows a short video of a self-driving car.

Students discuss:

- What information the car stores
- How it reacts to traffic signals and other vehicles

Visual Aid (3 min)

Display images provided in the chapter.

Recapitulation (2 min)

- What are reactive machines?
- What is an example of limited-memory AI?

PERIOD 4: ADVANCED AI TYPES

Previous Knowledge Testing (5 min)

- Can machines understand emotions?
- Can robots interact socially like humans?

Content Explanation (25 min)

Explain advanced AI types:

3. Theory-of-Mind Machines

- Can understand human emotions, thoughts and intentions
- Can interact socially

Example: Robots that recognize emotions.

(Currently under development.)

4. Self-Aware Machines

- Have self-awareness
- Understand their own state and surroundings
- Have goals and opinions

These machines do not yet exist in reality.

Activity (10 min)

Students perform ‘Do It Yourself’ – Emotion Detective Game and Self-Awareness Exploration – in the class.

Visual Aid (3 min)

Show images provided in the chapter.

Recapitulation (2 min)

- Which AI type can understand emotions?
- Which AI type is self-aware?

LESSON PLAN

COMPUTER – A WONDER MACHINE
CLASS VII
Chapter 10: LATEST TECHNOLOGIES—THE GAME CHANGER

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the meaning of technology and reality in technology.
- Explain the concept of Extended Reality (XR).
- Describe Virtual Reality (VR) and its uses.
- Explain Augmented Reality (AR) and its applications.
- Differentiate between Virtual Reality and Augmented Reality.
- Understand the concept of Mixed Reality (MR).
- Identify real-life applications of XR in education, gaming, healthcare and tourism.
- Develop creativity by designing a smart home using advanced technologies.

PERIOD 1: INTRODUCTION TO TECHNOLOGY AND EXTENDED REALITY

Previous Knowledge Testing (5 min)

- What do you understand by technology?
- Can technology change the way we see the world?
- Have you heard about Virtual Reality or Augmented Reality?

Content Explanation (30 min)

- Explain the meaning of Technology:
    - Application of scientific knowledge to solve problems and improve life.
- Explain Reality in technology:

    - The state of things as they exist or appear.
- Introduce Extended Reality (XR):
    - Technologies that create, alter or enhance the perception of reality using computer-generated environments.
- Explain that XR includes:
    - Virtual Reality (VR)
    - Augmented Reality (AR)
    - Mixed Reality (MR)

Visual Aid (5 min)

Show pictures or videos of VR headsets, AR apps and MR devices.

Recapitulation (5 min)

- What is technology?
- What does XR stand for?

PERIOD 2: VIRTUAL REALITY (VR)

Previous Knowledge Testing (5 min)

- Have you ever played a video game that felt very real?
- How do VR headsets work?

Content Explanation (25 min)

Explain Virtual Reality (VR):

- A computer-generated 3D environment.
- Users wear VR headsets to experience a virtual world.
- Creates a fully immersive experience.

Explain Applications of VR:

Gaming

- Interactive games like VR-based action or rhythm games.

Education

- Virtual field trips

- Exploring complex topics such as human anatomy.

Healthcare

- Training doctors
- Treating phobias and anxiety.

Tourism

- Visiting distant places virtually.

Activity (10 min)

Students to perform 'Do It Yourself' – Create simple VR viewer using cardboard box and smartphone.

Visual Aid (3 min)

Show images of VR gaming, VR classrooms or VR tourism.

Recapitulation (2 min)

- What is Virtual Reality?
- Name one application of VR.

PERIOD 3: AUGMENTED REALITY (AR)

Previous Knowledge Testing (5 min)

- Have you used camera filters on a phone?
- Have you heard of games that add digital objects into the real world?

Content Explanation (25 min)

Explain Augmented Reality (AR):

- Combines digital elements with the real world.
- Can be accessed through smartphones, tablets or smart glasses.

Explain Applications of AR:

Gaming and Entertainment

- Games where digital characters appear in real surroundings.

Education

- Viewing 3D models of historical places or human organs.

Healthcare

- Doctors visualize medical images during surgeries.

Tourism

- Navigation and historical information at tourist places.

Activity (10 min)

Students to perform 'Do It Yourself' – Download or explore an AR app (like Google Lens – object recognition apps). They list five interesting things discovered using AR.

Visual Aid (3 min)

Show screenshots or demonstrate AR-based apps and games.

Recapitulation (2 min)

- What is Augmented Reality?
- How is AR used in education?

PERIOD 4: DIFFERENCE BETWEEN VR, AR AND MIXED REALITY

Previous Knowledge Testing (5 min)

- Which technology creates a fully virtual world?
- Which technology adds digital objects to the real world?

Content Explanation (25 min)

Explain difference between AR and VR:

Augmented Reality	**Virtual Reality**
Adds digital elements to the real world	Creates a completely virtual world
No headset required	Requires VR headset
User still sees the real environment	User is fully immersed in virtual world

Introduce Mixed Reality (MR):

- Combines VR and AR.

- Real and virtual objects interact in real time.
- Requires special devices like MR headsets.

Explain how MR allows users to:

- Manipulate virtual objects in real environments.
- Interact with both physical and digital elements.

Activity (10 min)

Assign ‘Do It Yourself’ – To create a poster comparing AR and VR as a home task.

Visual Aid (3 min)

Show table comparing VR, AR and MR.

Recapitulation (2 min)

- What is Mixed Reality?
- Name one difference between AR and VR.

PERIOD 5: APPLICATIONS OF XR AND SMART HOMES

Time: 45 minutes

Previous Knowledge Testing (2 min)

- Can technology make our homes smarter?
- What devices can be used in a smart home?

Content Explanation (15 min)

Explain Smart Homes using XR technologies:

- Smart mirrors showing schedules
- VR entertainment rooms
- MR kitchen assistants
- Smart lighting and security systems

Explain how XR improves:

- User interaction
- Automation
- Convenience

Activity (15 min)

Students to perform ‘Do It Yourself’ – Dream Smart Home Activity.

Visual Aid (11 min)

Show videos of Smart Cities and Smart Home using link provided in the chapter.

Recapitulation (2 min)

- What does XR stand for?
- Name the three XR technologies.
- What is Mixed Reality?

LESSON PLAN

COMPUTER – A WONDER MACHINE
CLASS VII
Chapter 11: EXPLORING AI DOMAINS—NLP AND STATISTICAL DATA

Period Duration: 45 minutes

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Understand the three main domains of Artificial Intelligence.
- Explain the concept of Natural Language Processing (NLP).
- Identify different applications of NLP in daily life.
- Understand the concept and importance of Statistical Data in AI.
- Identify real-life uses of statistical data analysis.
- Recognize the ethical considerations in AI systems.
- Develop awareness about fair and responsible use of AI technologies.

PERIOD 1: INTRODUCTION TO AI DOMAINS

Previous Knowledge Testing (5 min)

- What is Artificial Intelligence?
- Can machines see, understand language or analyze numbers like humans?
- Have you used any AI application in daily life?

Content Explanation (25 min)

Introduce AI Domains.

Explain that machines need abilities similar to humans:

- Seeing
- Understanding language
- Understanding numbers

Explain the three main AI domains:

1. Computer Vision
    - Machines can see images and videos.
    - Uses cameras and sensors.
2. Natural Language Processing (NLP)
    - Machines understand human language.
    - Works with text and speech.
3. Statistical Data
    - Machines analyze numerical information.

Give examples:

- Computer Vision → Face recognition
- NLP → Voice assistants
- Statistical Data → Weather prediction

Activity (10 min)

Students to list examples of AI applications they use that belong to the three domains.

Visual Aid (2 min)

Display diagrams showing three AI domains.

Recapitulation (3 min)

- Name the three AI domains.
- Which domain helps machines understand language?

PERIOD 2: NATURAL LANGUAGE PROCESSING (NLP)

Previous Knowledge Testing (5 min)

- How do voice assistants understand our commands?
- How do phones predict the next word when typing?

Content Explanation (30 min)

Explain Natural Language Processing (NLP):

- Enables machines to understand and process human language.
- Works with spoken or written text.

Explain How NLP Works:

1. Input speech or text
2. System cleans and processes the data
3. AI analyzes meaning
4. Provides appropriate response

Explain Benefits of NLP:

- Helps computers communicate with humans
- Processes large amounts of text quickly
- Understands context and meaning

Applications of NLP

- Grammar and spelling correction tools
- Autocomplete and text prediction
- Digital assistants

Activity (5 min)

Students write a short invitation message (50 words) and check it using a grammar-checking tool in lab. They observe how errors are corrected. Also perform 'Do It Yourself' based on Grammar-checker.

Visual Aid (3 min)

Show examples and websites provided in the chapter.

Recapitulation (2 min)

- What is NLP?
- Name one application of NLP.

PERIOD 3: STATISTICAL DATA IN AI

Previous Knowledge Testing (5 min)

- What type of information is called numerical data?

- Can numbers help us make decisions?

Content Explanation (25 min)

Explain Statistical Data:

- AI analyzes large amounts of numerical data.
- Examples include:
    - Age
    - Temperature
    - Exam marks
    - Population data

Explain Importance of Statistical Data:

- Finds hidden patterns
- Helps in decision-making
- Makes information easier to understand through charts and graphs

Explain Applications of Statistical Data:

- COVID-19 vaccination planning
- Weather prediction
- Tourism growth analysis

Activity (10 min)

Students to perform 'Do It Yourself' based on Statistical Data.

Visual Aid (3 min)

Show simple charts or graphs representing numerical data.

Recapitulation (2 min)

- What is statistical data?
- Name one application of statistical data.

PERIOD 4: ETHICS IN AI DOMAINS

Previous Knowledge Testing (5 min)

- Should AI systems treat everyone fairly?
- Why is privacy important when using technology?

Content Explanation (25 min)

Explain Ethics in Artificial Intelligence.

Ethics means understanding what is right and wrong when using technology.

Explain important ethical principles:

- Informed Consent – Users should know how their data will be used.
- Voluntary Participation – People should not be forced to participate.
- Avoiding Harm – AI systems should not harm people.
- Confidentiality – Personal information should remain private.
- Anonymity – Identities should be protected.
- Relevance – Matter for the evaluation should be examined.

Explain Ethical Issues in NLP:

- Bias in data
- Difficulty understanding accents or slang
- Errors in speech or text recognition

Explain Ethics in Statistical Data:

- Transparency
- Fairness
- Privacy protection
- Accountability
- Security

Activity (10 min)

Students discuss:

- Why AI systems should be fair and unbiased.
- How privacy should be protected while using AI.

Visual Aid (3 min)

Display a chart showing ethical principles in AI.

Recapitulation (2 min)

- What does ethics mean in AI?
- Name one ethical principle.

LESSON PLAN

COMPUTER – A WONDER MACHINE
Class VII

Chapter 12: AI FOR SUSTAINABILITY AND SOCIAL DEVELOPMENT

Period Duration: 45 minutes

Learning Objectives:
Students will be able to:

- Understand natural resources and energy sources.
- Explain the concept of sustainability.
- Identify Sustainable Development Goals (SDGs).
- Understand the SDG Wedding Cake concept.
- Learn about systems thinking and system maps.
- Understand how AI can help solve environmental challenges.
- Identify AI applications for environmental monitoring.

PERIOD 1: NATURAL RESOURCES AND ENERGY

Previous Knowledge Testing (5 min)

- What is energy?
- Can you name some natural resources?
- What are renewable and non-renewable resources?

Content Explanation (30 min)

Explain Natural Resources

Natural resources are materials and energy sources provided by nature such as:

- Land
- Air
- Water

- Minerals
- Fossil fuels
- Renewable energy sources like solar and wind energy

Explain that these resources provide energy forms like:

- Light
- Heat
- Motion
- Sound

Explain examples of Energy Use

- Vehicles use fuel energy
- Cooking uses heat energy
- Bulbs produce light energy
- Machines produce motion energy

Explain difference between:

Fossil Fuels

- Coal
- Petroleum
- Natural gas

Renewable Energy

- Solar energy
- Wind energy
- Hydropower

Activity (5 min)

Students to perform ‘Do It Yourself’ activity

- Identify objects that use fuel energy.
- Identify objects that use human energy.

Visual Aid (3 min)

Teacher shows pictures of energy sources and objects producing light energy.

Recapitulation (2 min)

- What are natural resources?
- Name two renewable energy sources.

PERIOD 2: SUSTAINABILITY AND SOCIETY

Previous Knowledge Testing (5 min)

- What happens if we waste natural resources?
- Why should we save water and electricity?

Content Explanation (30 min)

Explain Sustainability

Sustainability means using resources responsibly so they are available for future generations.

Explain the Sandwich Example: If one person finishes all the jam today, others cannot use it later. Similarly, if we waste Earth's resources today, future generations will suffer.

Explain Society and Sustainability

Society refers to people living together.

For sustainability to work:

- Everyone must participate
- People must conserve resources
- Communities must work together

Activity (5 min)

Students perform 'Do It Yourself' – Sustainability Brainstorming – in the class.

Visual Aid (3 min)

Teacher shows examples of sustainable and non-sustainable activities.

Recapitulation (2 min)

- What is sustainability?
- Why is sustainability important?

PERIOD 3: SUSTAINABLE DEVELOPMENT GOALS (SDGs)

Previous Knowledge Testing (5 min)

- Have you heard about global goals to protect the environment?
- Who works to solve world problems?

Content Explanation (30 min)

Explain Sustainable Development Goals (SDGs)

- Created by the United Nations in 2015
- Target year 2030
- Total 17 goals

Explain examples of SDGs:

- No Poverty
- Zero Hunger
- Good Health and Well-being
- Quality Education
- Gender Equality
- Clean Water and Sanitation
- Affordable and Clean Energy
- Climate Action
- Life Below Water
- Life on Land, etc.

Explain that SDGs help countries solve global problems and create sustainable development.

Visual Aid (5 min)

Teacher shows SDG icons and SDG chart.

Recapitulation (5 min)

- How many SDGs are there?
- What is the target year for SDGs?

PERIOD 4: SDG WEDDING CAKE CONCEPT

Previous Knowledge Testing (5 min)

- What are the three main parts of sustainable development?
- Why must economic development respect nature?

Content Explanation (30 min)

Explain SDG Wedding Cake Model

It divides sustainability into three levels:

1. Economy

2. Society

3. Biosphere

Explain key idea:

Economy must serve society within Earth's environmental limits.

Activity (5 min)

Students perform ‘Do It Yourself’ provided in the chapter in the class.

Visual Aid (3 min)

Teacher shows SDG Wedding Cake diagram provided in the chapter.

Recapitulation (2 min)

- What are the three layers of the SDG wedding cake?

PERIOD 5: SYSTEMS THINKING

Previous Knowledge Testing (5 min)

- What happens if we solve one problem without considering others?
- Can one change affect many things?

Content Explanation (30 min)

Explain Systems Thinking

Systems thinking is a holistic approach to understanding complex problems.

Explain key ideas:

- A system is a group of interconnected parts.
- Components influence each other.
- Systems behave differently than individual parts.

Examples:

- Water cycle
- Food chain
- School system

Explain System Maps

System maps help visualize relationships between elements.

Elements include:

- Factors
- Relationships
- Positive relationship (+)
- Negative relationship (–)
- Feedback loops
- Time delays

Activity (5 min)

Students to perform 'Do It Yourself' – Create a simple system map of the water cycle.

Visual Aid (3 min)

Teacher shows examples and images provided in the chapter.

Recapitulation (2 min)

- What is systems thinking?
- What is a system map?

PERIOD 6: AI AS LEVERAGE and CORAL BLEACHING CASE STUDY

Previous Knowledge Testing (5 min)

- How can technology help protect the environment?

Content Explanation (30 min)

Explain AI as Leverage

Leverage means the best opportunity to bring positive change in a system.

AI helps by:

- Predicting environmental changes
- Analyzing data patterns
- Supporting decision-making

Explain Coral Bleaching Case Study

Facts:

- Coral reefs cover less than 1% of ocean floor
- Support 25% of marine species

Coral bleaching occurs when:

- Water temperature increases
- Pollution rises
- Algae leave coral reefs

Explain how AI can help

- Predict ocean temperature changes
- Monitor pollution levels
- Analyze environmental patterns
- Provide early warnings

Activity (5 min)

Students to perform ‘Do It Yourself’ in the class.

Visual Aid (3 min)

Teacher to show coral bleaching system map diagram.

Recapitulation (2 min)

- What is coral bleaching?

- How can AI help protect coral reefs?

PERIOD 7: AI APPLICATIONS FOR ENVIRONMENTAL MONITORING

Previous Knowledge Testing (5 min)

- Can computers help monitor the environment?

Content Explanation (30 min)

Explain AI Environmental Applications

1. Climate Change Monitoring

AI analyzes:

- Satellite images
- Weather patterns
- Environmental data

Helps predict climate changes.

2. Biodiversity Protection

AI helps scientists:

- Identify endangered species
- Track animal populations
- Monitor ecosystems

3. Smart Resource Management

AI helps manage:

- Energy consumption
- Water distribution
- Waste management

Activity (5 min)

Students discuss how AI can make their school eco-friendly.

Visual Aid (3 min)

Teacher shows examples of AI environmental monitoring systems.

Recapitulation (2 min)

- Name two AI applications for environmental monitoring.
