

LESSON PLAN

1. Number System

Teaching Objectives

Students will learn about

- ☞ Number system
- ☞ Decimal to Binary conversion
- ☞ Binary to Decimal conversion
- ☞ Operations on Binary numbers

Teaching Plan

Number of periods: 3

While teaching this chapter, tell the students that a number system is simply a method of counting. Introduce base or radix as the total number of digits used in a number system.

Inform them that there are four important types of number systems – Decimal (base 10), Binary (base 2), Octal (base 8) and Hexadecimal (base 16).

Make the students recall the method of writing expanded form of a number under Decimal number system.

Inform them that just like decimal number system:

- Add one more bullet In decimal number system, the numbers are expressed using ten digits, 0 to 9 and expanded with base 10.
- In octal number system, the numbers are expressed using eight digits, 0 to 7 and expanded with base 8.
- In hexadecimal number system, the numbers are expressed using fifteen digits, 0 to 9 and A to F, and expanded with base 16.

Show to the students the method of converting:

- Decimal number to Binary number by successive division by 2 and arranging the remainders in reverse order (Refer Suggested Activity 1 also).
- Binary number to Decimal number by multiplying digits with 2 raise to the power of place of that digit starting from 0 on the left (Refer Suggested Activity 2 also).

Share the rules of binary addition, subtraction, multiplication and division.

Show to the students the method of carrying out mathematical operations on binary numbers and verifying the results by corresponding conversions to decimal numbers.

Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.

Ask the students some oral questions based on this chapter.

- Q. What is a numbers system?
- Q. What is the radix of decimal / binary / octal / hexadecimal number system?
- Q. Which digits are used to express a decimal / binary / octal / hexadecimal number?
- Q. What is the value of addition of binary digits 1 and 1?
- Q. What is the value of subtraction of binary digits 0 and 1?
- Q. Which number system is used by computers?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 13 and 14 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Page 15. Help the students to solve these questions.

In Creative Assignment, activities like Hands-On and Fun in Lab given on Page 15 will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

1. Convert the last four digits of your parents' mobile numbers into binary number.
2. Ask the students to prepare a comparative chart with four columns, the first one listing the digits used in Hexadecimal number system and in the remaining three columns, their equivalent value under decimal, binary and octal number systems.

2. Formulas, Functions and Charts in Excel

Teaching Objectives

Students will learn about

- ☞ Formula basics
- ☞ Order of Operation
- ☞ Cell referencing in formulas and its types
- ☞ Functions
- ☞ Charts in Excel

Teaching Plan

Number of periods: 5

While teaching this chapter, tell the students that MS Excel has some built-in formulas called functions.

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

Show to them the different methods of copying and pasting a formula.

Tell them the order of operation followed in Excel.



Introduce cell referencing as 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.

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 and COUNT.

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

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

Demonstrate the use of date functions – TODAY, MONTH, YEAR and DAY (Refer Suggested Activity 1 also).

Show the different components of an Excel chart.

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

Demonstrate the steps of:

- Creating a chart (Refer Suggested Activity 2 also).
- Modifying a chart by changing its type, layout and design.

Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.

Ask the students some oral questions based on this chapter.

Q. What are Functions in Excel?

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

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

Q. Define cell referencing.

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?

Q. Define charts in Excel.

Q. What is a legend?

Q. What are gridlines in a chart?

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

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

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 28 and 29 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Pages 29 and 30. Help the students to solve these questions.

In Creative Assignment, activities like Fun in Lab given on Page 31 will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

1. Ask the students to enter their last mark sheet 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.
2. From the previous mark sheets of Grade 1 to 6, collect data about your attendance in various Grades. Plot a Line Chart in Excel from the data.

3. More on Excel

Teaching Objectives

Students will learn about

- ☞ Sorting data
- ☞ Filtering data
- ☞ Conditional formatting
- ☞ Printing a worksheet

Teaching Plan

Number of periods: 4

While teaching this chapter, tell the students that MS Excel provides easy options for sorting data and highlighting the required information in a worksheet.

Introduce sorting as arranging the data in ascending or descending order.

Demonstrate to the students the various steps involved in sorting of data in an Excel worksheet.

Share with the concept and use of Custom Sort feature (Refer Suggested Activity 1 also).

Introduce filtering as hiding unwanted data from a set of data.

Show to the students the various steps involved in applying Filters in a worksheet.

Share with the students that Filters once applied can be easily removed and tell them the method of removing filters.

Introduce Conditional Formatting as highlighting the required information.

Tell the students about basic difference between Filtering (unwanted information gets hidden) and Conditional Formatting (required information gets highlighted).

Explain the various criteria detailed under Conditional Formatting.

Demonstrate the steps involved in applying conditional formatting on a worksheet (Refer Suggested Activity 2 also).

Make the students recall that a printout is a hard copy of the information we see on the monitor.

Show to the students the steps involved in the printing of a worksheet.

Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.

Ask the students some oral questions based on this chapter.

Q. Define sorting.



- Q. What is the difference between sort and custom sort features?
- Q. What are filters?
- Q. How can filters be removed in a worksheet?
- Q. What do you understand by conditional formatting feature?
- Q. How is conditional formatting different from filtering data?
- Q. When is the conditional formatting criteria Highlight Cell Rules / Data Bars / Icon Sets used?
- Q. What is a printout?
- Q. What are the steps to print a worksheet?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 37 and 38 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Pages 38 and 39. Help the students to solve these questions. In Creative Assignment, activities like Fun in Lab given on Page 39 will enhance the ability of the students and serve as Subject Enrichment activity.

Suggested Activity

1. Ask the students to enter their height and weight along with similar information for their nine friends. Sort the data with primary criteria as heights in ascending order and secondary criteria as weights in descending order.
2. Highlight the cells where the heights are less than the height of the student or weight is more than the weight of the student preparing the worksheet.

4. Introduction to HTML

Teaching Objectives

Students will learn about

- ☞ What is HTML?
- ☞ HTML tags and attributes
- ☞ Rules for writing HTML codes
- ☞ HTML document structure
- ☞ Creating and saving HTML document
- ☞ Basic HTML tags
- ☞ Designing a web page
- ☞ Editing an exiting HTML

Teaching Plan

Number of periods: 5

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 about 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 along with their attributes.

Tell the students about some more HTML tags like Heading, Paragraph, Line Break, Horizontal Ruler (and its attributes), Bold, Italic, Underline, Superscript and Subscript tags.

Share with the students about the use of tag and its attributes.

Demonstrate to the students the steps involved in designing a web page using the various HTML tags discussed.

Show the students the method of editing an existing HTML document.

Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.

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

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

Q. What attributes can be taken by the tag?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 51 and 52 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Pages 52 and 53. Help the students to solve these questions.



In Creative Assignment, activities like Fun in Lab given on Page 53 will enhance the ability of the students and serve as Subject Enrichment activity.

Suggested Activity

Ask the students to develop a similar web page in HTML.

Basics of writing chemical formulas

The valency is used to write chemical formulas. The valency is written at the top right corner of the chemical symbol of the element. For example, valency of Sodium is 1 and is denoted as:

$$\text{Na}^{1+}$$

A chemical reaction is denoted as:

$$\text{C} + \text{O}_2 \longrightarrow \text{CO}_2$$
$$\text{H}_2\text{O} + \text{SO}_2 \longrightarrow \text{H}_2\text{SO}_4$$

5. Introduction to Photoshop

Teaching Objectives

Students will learn about

- ☞ Starting Photoshop CS6
- ☞ Components of Photoshop CS6
- ☞ Features of Photoshop CS6
- ☞ Creating a new file
- ☞ Saving a file
- ☞ Opening an image for editing
- ☞ Using tools

Teaching Plan

Number of periods: 4

While teaching this chapter, tell the students that Adobe Photoshop CS6 is powerful graphics software used for image creation and editing.

Demonstrate to the students the steps to start Adobe Photoshop CS6.

Familiarize the students with the components of Photoshop CS6 covering Menu Bar, Options Bar, Toolbar, Workspace, Color Panel, Adjustments Panel, Layers Panel and Status Bar.

Share with the students the features of Photoshop CS6.

Show to the students the steps involved in creating a new file and the various settings to be made while creating a file.

Tell the students the process to:

- Save a file.
- Open an image for editing

Show the Photoshop toolbar to the students and share with them the various tools present on it.

Tell the students that Adobe Photoshop CS6 has some tools hidden under a main tool.

Explain to the students the steps involved in the use of:

- Rectangle Marquee Tool – covering Elliptical Marquee Tool, Single Row Marquee Tool and Single Column Marquee Tool as hidden tools under it.
- Lasso Tool
- Quick Selection Tool
- Crop Tool
- Brush Tool
- Eraser Tool
- Rectangle Tool – covering Rounded Rectangle Tool, Ellipse Tool, Polygon Tool and Line Tool as hidden tools under it.
- Gradient Tool
- Paint Bucket Tool
- Horizontal Type Tool
- Pencil Tool

Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.

Ask the students some oral questions based on this chapter.

- Q. What is Adobe Photoshop CS6?
- Q. Name the various components of Photoshop CS6 interface.
- Q. State the features of Adobe Photoshop CS6.
- Q. What does RGB and CMYK color modes stand for?
- Q. Name some important tools of Photoshop toolbar.
- Q. State the use of Rectangular Marquee Tool / Lasso Tool / Crop Tool / Eraser tool / Rectangle Tool / etc.
- Q. What are the different gradient types available in Gradient Tool?
- Q. What is the difference between Rectangle Tool and Rectangular Marquee Tool?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 62 and 63 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Pages 63 and 64. Help the students to solve these questions.

In Creative Assignment, activities like Fun in Lab given on Page 64 will enhance the ability of the students and serve as a Subject Enrichment activity.



Suggested Activity

Ask the students to draw a similar drawing in Adobe Photoshop CS6 using various tools from the toolbar.



6. Animations in Flash

Teaching Objectives

Students will learn about

- ☞ Symbols
- ☞ Instances
- ☞ Converting an object into symbol
- ☞ Layers
- ☞ Frames and keyframes
- ☞ Animations in Flash

Teaching Plan

Number of periods: 4

While teaching this chapter, tell the students that Flash is an authoring tool to create games, applications, simple animations, etc.

Introduce the concept of Symbols in Flash CS6.

Tell the students about different types of symbols – graphic, button and movie clip – and explain their uses.

Show to the students the various steps involved in creating a symbol.

Introduce the meaning of the term Instances and the situation where they are used.

Demonstrate the steps involved in converting an object into symbol.

Tell the students about Layers and their importance in Flash.

Make the students understand the meaning of and difference between frames and keyframes.
Explain the concept of animation using tweens.
Show the steps to create various types of tweens covering Shape Tween and Motion Tween.
Tell the students that animation can also be done in Flash through Frame by Frame technique.
Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.
Ask the students some oral questions based on this chapter.

- Q. What is Adobe Flash used for?
- Q. What is the meaning of Symbols?
- Q. Name the different types of Symbols available in Flash.
- Q. Define instances.
- Q. What do you understand by Layers?
- Q. How are layers useful?
- Q. What is the difference between a frame and a keyframe?
- Q. Define Tween.
- Q. What is the meaning of easing?
- Q. What is Motion Guide Tweening?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 75 and 76 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Pages 76 and 77. Help the students to solve these questions. In Creative Assignment, activities like Fun in Lab given on Page 77 will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

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

7. Internet and E-mail

Teaching Objectives

Students will learn about

- ☞ The Internet
- ☞ World Wide Web
- ☞ How the web works?
- ☞ Using web browser
- ☞ Using URLs



- ☞ E-mail
- ☞ Emoticons, Acronyms and Netiquettes

Teaching Plan

Number of periods: 4

While teaching this chapter, tell the students that the internet is a computer network that connects hosts and end systems throughout the world.

Give a brief history of the beginning of internet as ARPANET.

Introduce the concept of World Wide Web (WWW) with reference to basic terms covering web, web servers, posting/uploading, etc.

Explain to the students the process of how the web works.

Introduce web browser as software application designed to find hypertext documents on the web.

Show to the students the steps involved in the process of launching the web browser.

Tell the students about Uniform Resource Locator or URL (unique internet address) and their use while navigating on internet.

Make the students recall E-mail as the process of exchanging messages electronically through communications network by using a computer.

Share with the students the advantages and disadvantages of e-mail.

Explain the components of an e-mail address to the students.

Demonstrate in detail the steps involved in:

- Creating an e-mail account
- Signing in to an e-mail account
- Sending an e-mail (with reference to fields like To, Cc, Bcc and Subject)
- Attaching files to an e-mail
- Reading a received e-mail
- Signing out from the e-mail account (tell them the importance of this step)

Introduce the terms emoticons (representation of facial expressions), acronyms (word formed from initial letters of a multi-word name) and netiquettes (set of rules to be followed for internet communication).

Write some commonly used emoticons and acronyms on the class board to elaborate the concept.

Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.

Ask the students some oral questions based on this chapter.

- Q. What is World Wide Web?
- Q. Define web server.
- Q. How the web works?
- Q. Expand URL.
- Q. Define an e-mail.
- Q. What do you understand by emoticons?
- Q. What is an acronym?
- Q. What are netiquettes?
- Q. State any three netiquettes.

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 88 and 89 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Page 90. Help the students to solve these questions.

In Creative Assignment, activities like Fun in Lab given on Page 90 will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to create an e-mail account. Tell them to design a birthday invitation card in Adobe Photoshop and send this card as an attachment to ten friends and/or relatives.

8. Computer Safety and Security

Teaching Objectives

Students will learn about

- ☞ How to keep your computer physically fit?
- ☞ Protecting your computer from illegal access
- ☞ How to backup your important files?
- ☞ Other maintenance techniques
- ☞ Malware
- ☞ Antivirus
- ☞ Firewall

Teaching Plan

Number of periods: 4

While teaching this chapter, tell the students that computer safety refers to the protection of computer-based resources against unauthorized use or physical damage.

Tell the students the method of physically cleaning computer parts like keyboard, mouse and monitor.

Share with the students the method to protect the computer from illegal access by reference to terms like authentication (verifying user's identity) and covering:

- Password protection
- Biometric authentication including face recognition, iris biometrics, retina biometrics and voice recognition
- Encryption (converting data into cypher text)

Explain the need, importance and process of backing up important files using external hard disk drives and online backup services.

Share with the students some information about some other maintenance techniques like deleting files, defragmenting hard disk drive and disk cleanup.



Introduce malware as programs designed to damage or carry out unwanted actions on a computer system.

Explain to the students information about different types of malware like virus, worms, Trojan horses, spyware, zombie, ransomware, rootkits and backdoors.

Explain the importance of antivirus and firewall in maintain computer safety and security.

Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.

Ask the students some oral questions based on this chapter.

- Q. Define authentication.
- Q. Where is elastic graph matching technique used?
- Q. What is the difference between encryption and decryption?
- Q. What is malware?
- Q. Define virus / worm / rootkit / backdoor / ransomware.
- Q. What is an anti-virus?
- Q. Name some commonly used anti-virus software.

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 99 and 100 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Pages 100 and 101. Help the students to solve these questions.

In Creative Assignment, activities like Fun in Lab given on Page 101 will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to prepare a detailed project on any anti-virus software on an A3 sheet.

9. Programming with Python

Teaching Objectives

Students will learn about

- ☞ Features of Python
- ☞ Basic commands of IDLE
- ☞ Character set
- ☞ Data types
- ☞ Comments in Python
- ☞ The print() statement
- ☞ How to use Python IDLE
- ☞ Variables in Python
- ☞ Keywords
- ☞ Operators
- ☞ The input() statement
- ☞ Creating simple Python programs

Teaching Plan

Number of periods: 4

While teaching this chapter, tell the students about Python as a high level programming language and its uses.

Share with the students the important features of Python.

Demonstrate the steps to start Python IDLE.

Familiarize the students with the interface of Python IDLE.

Tell the students the basic commands of IDLE like creating a new file, saving a file, opening an existing file, executing a programming file, closing a file and exiting IDLE.

Introduce variables as memory location used to store data.

Share with the students the rules of naming variable in Python.

Tell the students about important terms like character set, keywords and data types (covering number, string, list, tuple, dictionary and none).

Explain the operators used in Python stating the common arithmetic operators (+, -, *, /, //, %, **), relational operators (=, !=, >, <, >=, <=) and logical operators (&, |).

Demonstrate to the students the use of these operators and commands in simple Python programs.

Explain the use and importance of comments in Python.

Tell the students the purpose and syntax of:

- The input() statement
- The print() statement

Encourage the students to write simple programs in Python.

Ensure that the scope of Teacher's Corner given at the end of the chapter has been covered.

Ask the students some oral questions based on this chapter.

Q. What is Python?

Q. Expand IDLE.

Q. What is the use of arithmetic / logical / relational operators?

Q. Define keywords / variables / data types.

Q. What is the use of input() / print() statement?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 112 and 113 as One Touch Learn and Let's Do It. After solving the course book exercises, tell the students to solve Crack the Code activity given on Page 114. Help the students to solve these questions.

In Creative Assignment, activities like Hands-On and Fun in Lab given on Page 115 will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to develop programs in Python to calculate:

- Volume of cube
- Volume of cuboid
- Radius of circle when the area of the circle is given

