7

thinkcode

Ver. 2.0

Teacher's Manual

Extended Support for Teachers

avaeducation.in

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 to 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 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 needs 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.

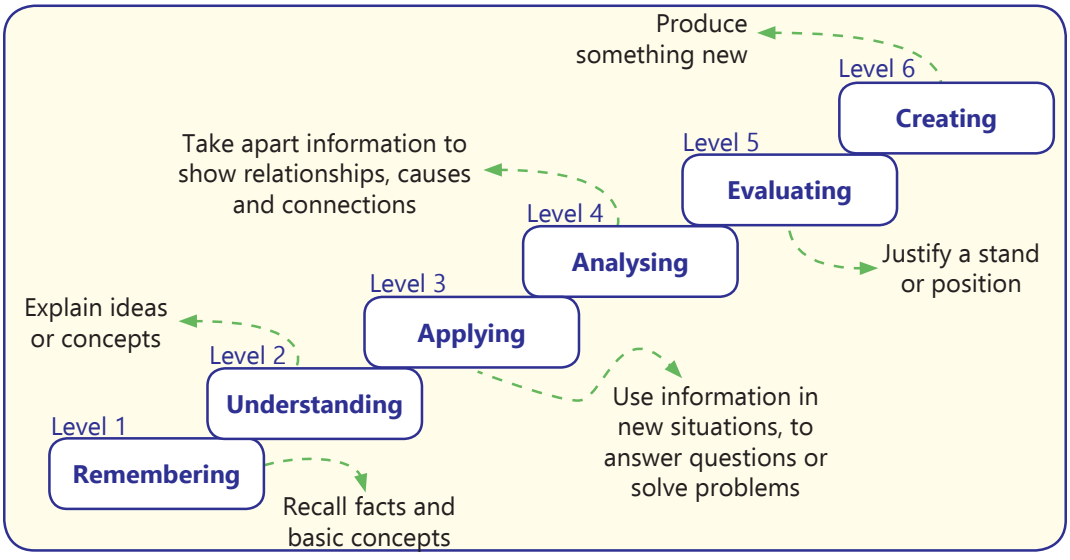
"Knowing yourself is the beginning of all wisdom."

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 7

LESSON PLAN

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1. Number System

Teaching Objectives

Students will learn about

- ☞ Number System
- ☞ Operations on Binary Numbers
- ☞ Number System Conversion

Number of Periods
3

Teaching Plan

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 For The Teacher given at the end of the chapter has been covered.

Extension

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 14 and 15 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Pages 15 and 16. Help the students to solve these questions.

In Creative Assignment, activities like Let's Get Better and Practical Zone given on Page 16 of the main course book 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. Charts in Excel 2016

Teaching Objectives

Students will learn about

- ☞ Components of a Chart
- ☞ Creating a Chart
- ☞ Types of Charts in Excel
- ☞ Changing Chart Type

Number of Periods
5

Teaching Plan

While teaching this chapter, tell the students that Excel 2016 has chart is an effective way to display data in pictorial form.

Show the different components of an Excel chart.

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

Explain each chart type to the students with examples:

- Line chart
- Pie chart
- Bar chart
- Area chart
- Scatter chart

Demonstrate the steps of:

- Creating a chart.
- Modifying a chart by changing its type, layout and design.

Ensure that the scope of For The Teacher given at the end of the chapter has been covered.

Extension

Ask the students some oral questions based on this chapter.

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 21, 22 and 23 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Page 23. Help the students to solve these questions.

In Creative Assignment, activity like Practical Zone given on Page 23 of the main course book will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

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. Advanced Features in Excel

Teaching Objectives

Students will learn about

- ☞ Sorting data
- ☞ Conditional formatting
- ☞ Filtering data

Number of Periods
4

Teaching Plan

While teaching this chapter, tell the students that Excel 2016 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.

Explain the concept and use of Custom Sort feature.

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

Show 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.

Ensure that the scope of For The Teacher given at the end of the chapter has been covered.

Extension

Ask the students some oral questions based on this chapter.

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?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 30 and 31 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Page 31. Help the students to solve these questions.

In Creative Assignment, activity Practical Zone given on Page 31 of the main course book will enhance the ability of the students and serve as a 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. More on Animate CC

Teaching Objectives

Students will learn about

- ☞ Creating a Motion Tween
- ☞ Creating a Shape Tween
- ☞ Using Masking
- ☞ Creating a Classic Tween
- ☞ Working with Layers
- ☞ Formatting Text in Animate CC

Number of Periods
4

Teaching Plan

While teaching this chapter, tell the students that in Animate CC, the movement of an object in-between the frames is called Tweens.

Explain the concept of animation using tweens.

Show to the the students the various steps involved in creating a Motion Tween.

Demonstrate to the the students the various steps involved in creating a Classic Tween.

Explain to the the students the various steps involved in creating a Shape Tween.

Make the students understand the Working with the Layers and the actions that can be performed on it like:

- Renaming a Layer
- Deleting a Layer

Show the steps to the students the use of Masking with help of proper pictures of the output.

Demonstrate the steps to the students to format text in Animate CC.

Ensure that the scope of For The Teacher given at the end of the chapter has been covered.

Extension

Ask the students some oral questions based on this chapter.

Q. Define Tween.

Q. What is Motion Tween?

Q. What is a Classic Tween?

Q. What is a Shape Tween?

Q. How to work with layers?

Q. How to rename a layer?

Q. How to delete a layer?

Q. What is masking?

Q. What are the steps to format text in Animate CC?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 43 and 44 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Page 45. Help the students to solve these questions.

In Creative Assignment, activities like Let's Get Better and Practical Zone given on Page 45 of the main course book 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.

5. Tags and Attributes in HTML

Teaching Objectives

Students will learn about

☞ HTML

☞ HTML Tags and Attributes

Number of Periods
2

Teaching Plan

While teaching this chapter, tell the students about HTML and Internet.

Introduce HTML to the students using examples.

Explain to the students the HTML tags and attributes which are:

- <HTML> tag
- <HEAD> tag
- <Title> tag
- <BODY> tag

- <Hn> tag
- <P> tag
-
 tag
- <HR> tag
- <PRE> tag
- <B> tag
- <I> tag
- <U> tag
- <SUP> tag
- <SUB> tag
- <FONT> tag
- <CENTER> tag

Demonstrate to the students the steps involved in using these tags using programs and syntax.

Ensure that the scope of For The Teacher given at the end of the chapter has been covered.

Extension

Ask the students some oral questions based on this chapter.

Q. What is HTML?

Q. What is the function of:

- <HTML> tag
- <HEAD> tag
- <Title> tag
- <BODY> tag
- <Hn> tag
- <P> tag
-
 tag
- <HR> tag
- <PRE> tag
- <B> tag
- <I> tag
- <U> tag
- <SUP> tag
- <SUB> tag
- <FONT> tag
- <CENTER> tag

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 53 and 54 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Page 54. Help the students to solve these questions.

In Creative Assignment, activities like Let's Get Better and Practical Zone given on Page 54 of the main course book will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the student to create a web page using all the HTML Tags taught in this chapter.

6. Lists and Tables in HTML

Teaching Objectives

Students will learn about

- ☞ Creating Lists
- ☞ Creating Tables

Number of Periods
2

Teaching Plan

While teaching this chapter, tell the students that HTML tags are used to create a web page.

Introduce list as collection of related items.

Tell the students that there are three types of lists – Ordered List (Numbered List), Unordered List (Bulleted List) and Definition List (Description List).

Explain the use of <OL> tag to create ordered lists, <UL> tag to create unordered lists and <DL> tag to create definition lists. (See Suggested Activity 1 also).

Explain the use of <TABLE> tag and its child tags covering <TR>, <TD>, <TH> and <Caption>.

Explain the use of different attributes of <TABLE> tag covering BORDER, BORDERCOLOR, FRAMES, BGCOLOR, BACKGROUND, HEIGHT, WIDTH, CELLSPACING and CELLPADDING.

Discuss the use of different attributes of <TD> tag explaining about ALIGN, BGCOLOR, WIDTH, ROWSPAN, COLSPAN and VALIGN attributes.

Tell the students that all the attributes except ROWSPAN and COLSPAN are taken up by <TR> tag also.

Demonstrate the code to create a table and its data in HTML. (See Suggested Activity 2 also).

Ensure that the scope of For The Teacher given at the end of the chapter has been covered.

Extension

Ask the students some oral questions based on this chapter.

Q. Define List / Table.

Q. How many types of Lists can be created in HTML?

Q. Name the different types of Lists that can be created in HTML.

Q. What is an Ordered / Unordered / Definition List?

Q. Name the attributes of <OL> tag.

Q. Name the tags used to create Definition List.

Q. Name the tags that can used to create different kinds of tables.

Q. What are the attributes of <TABLE> / <TD> tag?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 68 and 69 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Page 70. Help the students to solve these questions.

In Creative Assignment, activity Practical Zone given on Page 70 of the main course book will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to create:

- List of favorite games of 10 friends.
- Table of car names and their models.

7. More on Internet

Teaching Objectives

Students will learn about

- ☞ E-mail
- ☞ Google drive
- ☞ Blogging
- ☞ Emoticons and Acronyms
- ☞ E-commerce
- ☞ Podcasting

Number of Periods
3

Teaching Plan

While teaching this chapter, 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 For The Teacher given at the end of the chapter has been covered.

While teaching this chapter, tell the students about advanced features of internet such as:

- cloud storage
- E commerce

- Blogging
- podcasting

Tell the students about E-commerce and different modes of payment available at different E-commerce platforms

- Debit or credit cards
- Net banking
- E-wallet
- Cash on delivery

Demonstrate the steps to shop online on any e- commerce website

Show to the students what is a blog and explain blogging

Demonstrate the steps to create a blog on blogger.com

Explain to the students what is podcasting

Tell the students about the various cloud storage services

Demonstrate the application of Google drive

Show to the students the steps involved in organizing files and folders in Google drive.

- Creating a folder
- Moving a file to a folder
- Duplicating a file
- Removing a file
- Opening a file to work on it
- Sharing a file or folder

Ensure that the scope of For The Teacher given at the end of the chapter has been covered.

Extension

Ask the students some oral questions based on this chapter.

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.

Q. What is e-commerce?

Q. What do you mean by cash on delivery?

Q. What is a blog?

Q. Who is a blogger?

Q. What do you mean by a podcast?

Q. Define cloud storage service.

Q. What is Google docs?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 92 and 93 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Page 94. Help the students to solve these questions.

In Creative Assignment, activity Practical Zone given on Page 94 of the main course book 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 and send this card as an attachment to ten friends and/or relatives.

Divide the class into two teams. Ask one team to prepare charts on various e-commerce websites. Ask the other team to prepare a online blog on the same topic. Make the students share the benefits enjoyed and limitations faced by each team while working on their project.

8. Algorithms and Flowcharts

Teaching Objectives

Students will learn about

- ☞ Algorithm
- ☞ Uses of an Algorithm
- ☞ Defining Flowcharts
- ☞ Characteristics of a Good Algorithm
- ☞ Writing an Algorithm
- ☞ Solving Problems Using Algorithms and Flowcharts

Number of Periods
4

Teaching Plan

While teaching this chapter, tell the students about how humans communicate and their language. Also give an introduction of problem solving techniques, algorithm, flowchart, etc.

- **Program** – a set of instructions given to CPU in a pre-defined sequence to complete a task.
- **Computer language** – means by which data and instructions are transmitted to the computer.
- **Syntax** – the grammar of a computer language.
- **Programming** – process of writing a program.
- **Programmers** – people who write computer programs.

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

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

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.

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

Ensure that the scope of For The Teacher given at the end of the chapter has been covered.

Extension

Ask the students some oral questions based on this chapter.

Q. What is an algorithm?

Q. What is a flowchart?

Q. What are the characteristics of a good algorithm?

Q. What are uses of an algorithm?

Evaluation

After explaining the chapter, let the students do the course book exercises given on Pages 101 and 102 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Page 102. Help the students to solve these questions.

In Creative Assignment, activities like Let's Get Better and Practical Zone given on Page 103 of the main course book will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to find some questions which can be solved using algorithm and flowchart.

9. Introduction to Programming

Teaching Objectives

Students will learn about

- Computer Languages
- Working of Language Translators
- Features of Python
- Programming in Python
- Language Translator
- Python
- Installing Python
- Input and Output

- ☞ Variables in Python
- ☞ Comments in Python
- ☞ Precedence of Operators
- ☞ Data Types
- ☞ Operators
- ☞ Sample Programs

Number of Periods
4

Teaching Plan

While teaching this chapter, 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, COBOL, FORTRAN, PASCAL, etc.), fourth generation languages (examples: Visual Basic, Oracle, SQL, JAVA, C++, etc.) and natural language or fifth generation languages (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** – used to translate assembly language into machine language.
- **Compiler** – used to convert source program at once into machine language before executing it.
- **Interpreter** – used to convert source program one line at a time into machine language before executing it.

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
- Object-oriented
- Interpreted language
- Open-source language
- Integrated and Extensible language
- Dynamically Typed language

Demonstrate the students the steps to install Python.

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

- Script Mode
- Interactive Mode

Show to the students the components of Python window.

Share with the students the working in Script mode and demonstrate the steps involved in the four step process , i.e.,

- Creating a new file
- Saving Python program
- Writing a program
- Running a Python program

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

Tell the students the Variables in Python along with the declaring and initializing a variable with syntax.

Explain to the students the Data Types and Comments in Python with syntax.

Show the students the proper use of Single Line and Multiple-line comment in Python.

Explain to the students about Operators in Python and its types along with the syntax and description of that are:

- Arithmetic Operators
- Assignment Operators
- Logical Operators
- Relational Operators

Tell the students about the Precedence of Operators with the help of sample programs in Python.

Ensure that the scope of For The Teacher given at the end of the chapter has been covered.

Extension

Ask the students some oral questions based on this chapter.

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 are advantages of HLL?

Q. What are disadvantages of HLL?

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.

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 course book exercises given on Pages 120, 121 and 122 of the main course book as Exercise. After solving the course book exercises, tell the students to solve Activity Zone activity given on Page 122. Help the students to solve these questions.

In Creative Assignment, activity Practical Zone given on Page 122 of the main course book will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

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