6

# TRACKPAD

Ver. 2.0 (102)

# Teacher's Manual

*Extended Support for Teachers*

ORANGE
www.orangeeducation.in
www.thetouchpad.com

# Teacher's Time Table

| Periods / Days | 0 | I | II | III | IV | BREAK | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|---|---|
| Monday | | | | | | | | | | |
| Tuesday | | | | | | | | | | |
| Wednesday | | | | | | | | | | |
| Thursday | | | | | | | | | | |
| Friday | | | | | | | | | | |
| Saturday | | | | | | | | | | |

# Development Milestones in a Child

Development milestones are a set of functional skills or age-specific tasks that most children can do at a certain age. These milestones help the teacher to identify and understand how children differ in different age groups.

| Age 5 - 8 Years | |
|---|---|
| **Physical** | • First permanent tooth erupts<br>• Shows mature throwing and catching patterns<br>• Writing is now smaller and more readable<br>• Drawings are now more detailed, organised and have a sense of depth |
| **Cognitive** | • Attention continues to improve, becomes more selective and adaptable<br>• Recall, scripted memory, and auto-biographical memory improves<br>• Counts on and counts down, engaging in simple addition and subtraction<br>• Thoughts are now more logical |
| **Language** | • Vocabulary reaches about 10,000 words<br>• Vocabulary increases rapidly throughout middle childhood |
| **Emotional/Social** | • Ability to predict and interpret emotional reactions of others enhances<br>• Relies more on language to express empathy<br>• Self-conscious emotions of pride and guilt are governed by personal responsibility<br>• Attends to facial and situational cues in interpreting another's feelings<br>• 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<br>• Cognitive self-regulation is now improved |
| **Language** | • Ability to use complex grammatical constructions enhances<br>• Conversational strategies are now more refined |
| **Emotional/Social** | • Self-esteem tends to rise<br>• Peer groups emerge |

| Age 11 - 20 Years | |
|---|---|
| **Physical** | • If a girl, reaches peak of growth spurt<br>• If a girl, motor performance gradually increases and then levels off<br>• If a boy, reaches peak and then completes growth spurt<br>• If a boy, motor performance increases dramatically |
| **Cognitive** | • Is now more self-conscious and self-focused<br>• Becomes a better everyday planner and decision maker |
| **Emotional/Social** | • May show increased gender stereotyping of attitudes and behaviour<br>• 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.

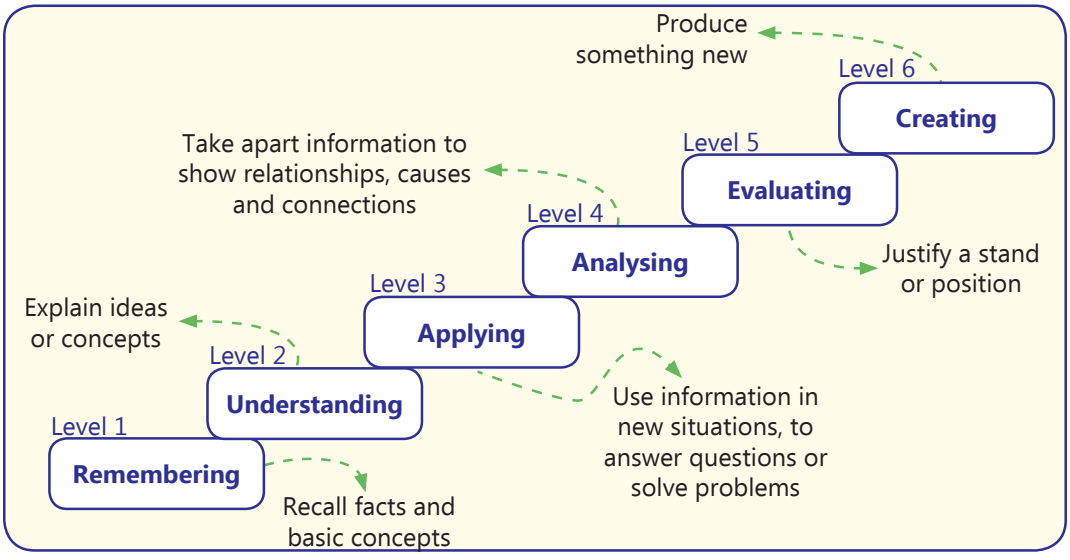
"Knowing yourself is the beginning of all wisdom."

## 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 6

# LESSON PLAN

Trackpad Ver 2.0 (102)

## 1. Fundamentals of Computer

### Teaching Objectives

Students will learn about

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

| Number of Periods | |
|---|---|
| Theory | Practical |
| 3 | 0 |

### Teaching Plan

Before starting the chapter, ask the students to read the comic given in page number 7 to understand the recap of the topic.

While teaching this chapter, tell the students that a computer is an electronic device that performs diverse operations with the help of instructions to process the data in order to achieve desired results.

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

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

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

Showcase the basic definitions of these three types of computer:

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

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

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

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

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

- Functioning
- Size
- Speed
- Processing power and cost

Make them understand these categories in details with examples.

Tell the students about the type of computers with examples:

- explain **Microcomputer** and examples like Desktop computer, Laptop and Tablet.
- explain **Mainframe Computer** with example like IBM zSeries.
- explain **Supercomputer** with examples like PARAM, Cray-1, etc.

Make them understand that there are some other special computers:

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

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

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

- Input Devices
- Processing Devices
- Output Devices

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

## Extension

Ask the students some oral questions based on this chapter.

Q. What is an analog computer?

Q. What is a digital computer?

Q. What is a hybrid computer?

Q. What is a microcomputer?

Q. What is a minicomputer?

Q. What is a mainframe computer?

Q. What is a supercomputer?

Q. Give examples of:

- Analog Computer
- Digital computer
- Hybrid Computer

### Evaluation

After explaining the chapter, let the students do the exercises given on Pages 15, 16 and 17 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 18.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 18 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

### Suggested Activity

Ask the students to collect pictures of different types of computers and paste them on a chart paper according to the categories explained in this chapter.

## 2. Formulas and Functions in Excel 2016

### Teaching Objectives

Students will learn about

- Data Types in Excel 2016
- Operator Precedence
- Cell Range
- Functions
- Operators in Excel 2016
- Ways to Enter a Formula in Excel 2016
- Cell References

| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 2 |

### Teaching Plan

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

Introduce data type in Excel to the students.

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.

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.

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

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

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

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

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

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

Ask the students to solve the exercise **I Know** given on page number 26.

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

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

Ask the students to solve the exercise **Quiz Bee** given on page number 28.

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

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

## Extension

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?

## Evaluation

After explaining the chapter, let the students do the exercises given on Page 30 and 31 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 32.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 32 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

## Suggested Activity

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.

# 3. Charts in Excel 2016

## Teaching Objectives

Students will learn about

- Charts
- Components of a Chart
- Creating a Chart
- Setting the Data Range
- Moving and Resizing the Chart
- Changing Background of the Chart
- Advantages of Charts
- Types of Charts
- Changing Chart Type

| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 2 |

## Teaching Plan

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

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.

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

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

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

Demonstrate the steps of:

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

## 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 exercises given on Page 41, 42 and 43 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 44.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 43 and 44 in the main course book. This 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.

## 4. Introduction to Tupi 2D

### Teaching Objectives

Students will learn about

- Features of Tupi 2D
- Starting Tupi 2D Software
- Creating a New Tupi 2D Project
- Opening an Existing Tupi 2D Project
- Installing TupiTube Desk
- Components of the Tupi 2D Window
- Saving a Project in Tupi 2D
- Exiting Tupi 2D

| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 3 |

### Teaching Plan

Tell the students about Tupi 2D and features of it.

Show the steps to install TubiTube Desk and start the application.

Explain the components of Tupi 2D window: Menu bar, Toolbox, Toolbar, Workspace, Paint Area Action Toolbar, Modules Tab, Left side bar and right side bar along with the functions.

Show the students how to create a document in Tupi 2D with labelled steps.

Demonstrate to the students the steps involved to create shapes in Tupi 2D.

Show the students the steps involved in:

-Saving a program

-Opening an existing project

-Exiting Tupi 2D

Ask the students to solve questions given on page 52 and 53 as **I Know** and **Quiz Bee**.

### Extension

Ask the students some oral questions based on this chapter.

Q. What is Tupi 2D?

Q. How to create a document in Tupi 2D?

Q. How to save a project in Tupi 2D?

Q. How to open an existing project in Tupi 2D?

Q. Which is a very useful free open source 2-D animation software which is used to create animations, graphics and multimedia programs?

### Evaluation

After explaining the chapter, let the students do the exercises given on pages 53 to 55 in the main course book as Checkpoint. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 55.

Take the students to the computer lab and let them practice the activity given in the Lab Session section on Page 55 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

### Suggested Activity

Ask the students to create any shape in Tupi 2D using the tools taught in this chapter.

## 5. Using Tools in TUPI 2D

### Teaching Objectives

Students will learn about

- ☞ Pencil Tool
- ☞ Polyline Tool
- ☞ Object Selection Tool
- ☞ Fill Tool
- ☞ Ink Tool
- ☞ Brushes Tool
- ☞ Node Selection Tool
- ☞ Library

| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 3 |

## Teaching Plan

While teaching this chapter, tell the students that the various tools present in the Tools panel are quite helpful in creating drawings in Tupi 2D.

Demonstrate the use of some important drawing tools along with some of their important properties to be defined in Tupi 2D covering:

- Pencil Tool – used to draw freehand lines and curves. The properties to be defined are Stroke Color, Stroke Height, Stroke Style and Cap.
- Ink Tool – used to draw in different colors. The properties to be defined are Stroke Color, Stroke Height, Stroke Style and Cap.
- PolyLine Tool – used to draw closed shapes like triangles and those having five or more sides. The properties to be defined are Style and Number of Sides.
- Brushes Tool – used to draw closed rectangles and squares. The properties to be defined are Stroke Color, Fill Color, Stroke Height and Stroke Style.
- Object Selection Tool – used to select parts or whole objects from the stage.
- Node Selection Tool – helps to reorder the nodes which are created while drawing the object.
- Fill Tool – used to fill colour in closed shapes. The properties to be defined are Fill Color.

Explain the use of the Library in Tupi 2D.

Ask the students to solve questions given on page 58 and 62 as **I Know** and **Quiz Bee**.

## Extension

Ask the students some oral questions based on this chapter.

Q. Which tool is used by the users to draw in different colour?

Q. Which tool helps to draw different shapes and diagrams in the workspace?

Q. What is the use of node selection tool?

Q. What is the use of Tools panel?

Q. What is the use of Pencil / Fill / Object Selection tools?

Q. What are the different properties that need to be defined for PolyLine / Brushes / Ink tools?

Q. Which key is pressed to draw a square or a circle?

Q. What is the use of Library?

### Evaluation

After explaining the chapter, let the students do the exercises given on pages 63 to 65 in the main course book as Checkpoint. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 66.

Take the students to the computer lab and let them practice the activity given in the Lab Session section on Page 65 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

### Suggested Activity

Ask the students to draw a triangle using the Pencil tool in TUPI 2D.

## 6. Learn HTML5 and CSS3

### Teaching Objectives

Students will learn about

- What is HTML?
- HTML Editor
- Understanding HTML5 Tags
- Attributes
- Rules for Writing HTML Codes
- Creating and Saving an HTML document
- <P> Tag
- <Hn> Tag
- History of HTML
- Features of HTML5
- Basic HTML Tags
- HTML comments
- Structure of an HTML Document
- Displaying a Web Page in a Web Browser
- <BR> Tag
- <HR> Tag
- Styling HTML5 Documents with Cascading Style Sheets
- Use of Inline CSS with HTML5 Tags

| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 4 |

### Teaching Plan

Before starting the chapter, ask the students to read the comic given in page number 70 to understand the recap of the topic.

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

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

Make the students aware 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 alone 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 <FONT> tag and its attributes.

Ask the students to solve the exercise **Quiz Bee** given on page number 78.

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.

Ask the students to solve the exercise **I Know** given on page number 81.

## Extension

Ask the students some oral questions based on this chapter.

Q. What is HTML?

Q. Define hypertext and Markup language.

Q. Name the different types of HTML editors.

Q. What are tags and attributes?

Q. State the rules followed while writing HTML codes.

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

Q. 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 <FONT> tag?

## Evaluation

After explaining the chapter, let the students do the exercises given on Page 81, 82 and 83 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 84.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 83 and 84 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

### Suggested Activity

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

# 7. Formatting a Web Page

### Teaching Objectives

Students will learn about

- Text Properties
- Font Properties
- Margin Properties
- Background Properties
- Using CSS to Control Multiple Pages

| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 3 |

### Teaching Plan

Before starting the chapter, ask the students to read the comic given in page number 85 to understand the recap of the topic.

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

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

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

Also show them a code to use all these properties.

Ask the students to solve the exercise **Quiz Bee** given on page number 87.

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

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

Also show them a code to use all these properties.

Tell the students about how to control multiple pages using CSS with the help of a program.

Ask the students to solve the exercise **I Know** given on page number 90.

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

## Extension

Ask the students some oral questions based on this chapter.

Q. Define following text properties:

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

Q. Define the following background properties:

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

Q. Define the following font properties:

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

Q. Define margin properties.

### Evaluation

After explaining the chapter, let the students do the exercises given on Pages 92 and 93 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 94.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 94 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

### Suggested Activity

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

# 8. Internet Services

### Teaching Objectives

Students will learn about

- ☞ Services on the Internet
- ☞ Safety on Internet

| Number of Periods | |
|---|---|
| Theory | Practical |
| 3 | 0 |

### Teaching Plan

Before starting the chapter, ask the students to read the comic given in page number 95 to understand the recap of the topic.

While teaching this chapter, brief the students about Internet.

Introduce Social Networking the students using examples.

Explain to the students the concept of Facebook in detail and also tell the steps involved in creating account on Facebook.

Demonstrate to the students the function of Twitter in detail and also tell the steps involved in creating account on Twitter.

Demonstrate to the students the steps involved in using Quora and Skype in details.

Explain the Internet services like:

- E-Banking
- Blogging
- OneDrive
- Podcasting
- Newsgroup
- Cloud Computing
- RSS

Tell the students the difference between a blog and a website.

Explain to the students the benefits and risks of using cloud computing.

Ask the students to solve the exercise **Quiz Bee** given on page number 98.

Ask the students to solve the exercise **I Know** given on page number 98.

## Extension

Ask the students some oral questions based on this chapter.

Q. What is Social network?

Q. What is Facebook?

Q. What is Twitter?

Q. What is Quora?

Q. What is Skype?

Q. What is E-banking?

Q. What is a newsgroup?

Q. What is blogging?

Q. What is cloud computing?

Q What is OneDrive?

Q. What is RSS?

Q. What is Podcasting?

## Evaluation

After explaining the chapter, let the students do the exercises given on Page 100 and 101 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 101.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 101 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

## Suggested Activity

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

# 9. Algorithm, Flowchart and Mind Maps

## Teaching Objectives

Students will learn about

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

| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 0 |

## Teaching Plan

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

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.

Make the students learn about Mind Maps and its structure.

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

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

Make the students learn that the high level languages are further classified as third generation languages (examples: **BASIC, 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.

Ask the students to solve the exercise **I Know** given on page number 105.

Ask the students to solve the exercise **Quiz Bee** given on page number 110.

## Extension

Ask the students some oral questions based on this chapter.

Q. What is an algorithm?

Q. What is a flowchart?

Q. What is a mind map?

Q. What are computer languages?

Q. What is Low-Level language?

Q. What is High-Level language?

Q. Give examples of each:

a. Machine Language b. Assembly Language

c. Third Generation Language d. Fourth Generation Language

e. Fifth Generation Language

Q. What 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.

## Evaluation

After explaining the chapter, let the students do the exercises given on Page 112 and 113 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 113.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 113 in the main course book. This 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. Also, ask the students to collect more information about the computer languages and translators.

# 10. Introduction to Python

## Teaching Objectives

Students will learn about

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

| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 3 |

## Teaching Plan

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

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

Introduce the students with Python and its use.

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

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

Demonstrate 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
- Writing a program
- Saving Python program
- Running a Python program

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

Ask the students to solve the exercise **I Know** given on page number 118.

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.

Ask the students to solve the exercise **Quiz Bee** given on page number 120.

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.

## Extension

Ask the students some oral questions based on this chapter.

Q. What is Python?

Q. What are features of Python?

Q. What are the steps to install Python?

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

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

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

Q. What are variables in Python?

Q. What are comments in Python?

Q. What are operators in Python?

## Evaluation

After explaining the chapter, let the students do the exercises given on Page 124 and 125 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise

as Coding Zone given on Page 126.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 126 in the main course book. This 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.

# 11. Intelligence and AI Approaches

### Teaching Objectives

Students will learn about

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

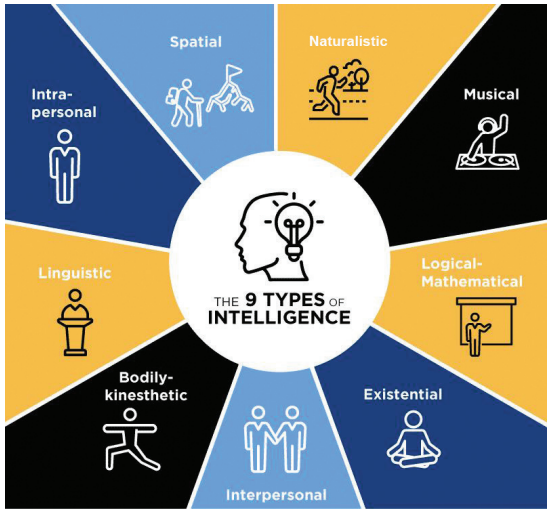
| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 0 |

### Teaching Plan

Before starting the chapter, ask the students to read the comic given in page number 127 to understand the recap of the topic.

Define the meaning of Intelligence to the students.

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



Visual-Spatial Intelligence

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

Make the students do some activities for exploring Intelligence.

Define the AI Approach which simulate human attribute:

- Rule Based Approach
- Learning Based Approach

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

Ask the students to solve the exercise **Quiz Bee** given on page number 131.

## Extension

Q. Define Intelligence.

Q. Define the qualities of these:

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

Q. Define the two AI approaches:

- Rule Based Approach
- Learning Based Approach

## Evaluation

After explaining the chapter, let the students do the exercises given on Page 132 and 133 in the main course book as Assess Yourself. Tell them to solve the computational skill developing exercise as Coding Zone given on Page 134.

Take the students to the computer lab and let them practice the activity given in the Lab Activity section on Page 134 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

## Suggested Activity

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