# TOUCHPAD

## Computer Applications-IX (Ver.2.0)

# TEACHER'S MANUAL

## Extended Support for Teachers

ORANGE
www.orangeeducation.in

# Teacher's Time Table

| Periods / Days | O | I | II | III | IV | | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|---|---|
| Monday | | | | | | B R E A K | | | | |
| Tuesday | | | | | | | | | | |
| Wednesday | | | | | | | | | | |
| Thursday | | | | | | | | | | |
| Friday | | | | | | | | | | |
| Saturday | | | | | | | | | | |

# DEVELOPMENT MILESTONES IN A CHILD

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

## Age 5 - 8 Years

### Physical

- First permanent tooth erupts
- Shows mature throwing and catching patterns
- Writing is now smaller and more readable
- Drawings are now more detailed, organised and have a sense of depth

### Cognitive

- Attention continues to improve, becomes more selective and adaptable
- Recall, scripted memory, and auto-biographical memory improves
- Counts on and counts down, engaging in simple addition and subtraction
- Thoughts are now more logical

### Language

- Vocabulary reaches about 10,000 words
- Vocabulary increases rapidly throughout middle childhood

### Emotional/ Social

- Ability to predict and interpret emotional reactions of others enhances
- Relies more on language to express empathy
- Self-conscious emotions of pride and guilt are governed by personal responsibility
- Attends to facial and situational cues in interpreting another's feelings
- Peer interaction is now more prosocial, and physical aggression declines

"If you cannot do great things, do small things in a great way."

## Age 9 - 11 Years

**Physical**
- Motor skills develop resulting in enhanced reflexes

**Cognitive**
- Applies several memory strategies at once
- Cognitive self-regulation is now improved

**Language**
- Ability to use complex grammatical constructions enhances
- Conversational strategies are now more refined

**Emotional/ Social**
- Self-esteem tends to rise
- Peer groups emerge

## Age 11 - 20 Years

**Physical**
- If a girl, reaches peak of growth spurt
- If a girl, motor performance gradually increases and then levels off
- If a boy, reaches peak and then completes growth spurt
- If a boy, motor performance increases dramatically

**Cognitive**
- Is now more self-conscious and self-focused
- Becomes a better everyday planner and decision maker

**Emotional/ Social**
- May show increased gender stereotyping of attitudes and behaviour
- May have a conventional moral orientation

Managing the children's learning needs according to their developmental milestones is the key to a successful teaching-learning transaction in the classroom.

" Family is the most important thing in the world. "

# Teaching Pedagogies

Pedagogy is often described as the approach to teaching. It is the study of teaching methods including the aims of education and the ways in which such goals can be achieved.

## Lesson Plans

A lesson plan is the instructor's road map which specifies what students need to learn and how it can be done effectively during the class time. A lesson plan helps teachers in the classroom by providing a detailed outline to follow in each class.

A lesson plan addresses and integrates three key components:

+ Learning objectives
+ Learning activities
+ Assessment to check the student's understanding

A lesson plan provides an outline of the teaching goals:

### Before the class

1. Identify the learning objectives.
2. Plan the lesson in an engaging and meaningful manner.
3. Plan to assess student's understanding.
4. Plan for a lesson closure.

### During the class

Present the lesson plan.

### After the class

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

" Knowing yourself is the beginning of all wisdom. "

Numerous strategies have evolved over the years to facilitate the teaching-learning process in the classrooms.

**Effective Teaching Strategies**

- Direct Instruction
- Performance Activities
- Classroom Discussion
- Small Group Work
- Student Research
- Problem Solving
- Cooperative Learning

## 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.

Recall facts and basic concepts

LEVEL 1
Remembering

Explain ideas or concepts

LEVEL 2
Understanding

Use information in new situations, to answer questions or solve problems

LEVEL 3
Applying

Take apart information to show relationships, causes and connections

LEVEL 4
Analysing

Justify a stand or position

LEVEL 5
Evaluating

Produce something new

LEVEL 6
Creating

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.

# LESSON PLAN

## Unit-1: Basics of Information Technology

# 1 Basics of Information Technology

## Teaching Objectives

Students will learn about

- ✦ Design of Computer
- ✦ Limitations of a Computer
- ✦ Components of a Computer System
- ✦ Units of Storage
- ✦ File System
- ✦ Cloud Computing
- ✦ Multimedia
- ✦ Social Network

- ✦ Characteristics of a Computer
- ✦ Communication Technology
- ✦ Memory and Storage Devices
- ✦ Software
- ✦ Computer Network
- ✦ Protocols
- ✦ Chat Sites

| Number of Periods | |
|---|---|
| Theory | Practical |
| 10 | 5 |

## Teaching Plan

**Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:**

Information Technology is the use of computers to gather, process, store, protect and transfer information. Modern computers are a storehouse of augmenting information.

A computer performs action and accomplishes its tasks in three basic stages namely: **Input**, **Process** and **Output**.

A program is a set of sequentially arranged instructions which directs the computer to process the input, in order to produce the required output or result.

A computer is a wonderful electronic machine and it has many significant features which make it a

multi-purpose device.

The special characteristics that make it such a popular and useful machine are:

- Speed
- Accuracy
- Reliability
- Storage Capacity
- Diligence
- Logical Ability
- Flexibility/Multitasking
- Transfer of Data

There are certain limitations of a computer which are given below:

- Apathetic
- Zero IQ
- Non-Heuristic
- Dependency

Communication refers to transfer of ideas or information from one place to another between different individuals. It means establishing links between places or people to share information and resources amongst each other.

Any sort of communication involves a sender, a receiver and a communication channel.



A computer system functions with the help of 'Hardware' and 'Software' components.

The physical components, which can be touched or felt are called the hardware components, whereas the components which cannot be touched or felt, such as instructions, data etc. form the software component of the system. Keyboard, Mouse etc. are hardware & MS Word, Windows etc. are software. Define all the input devices in detail with proper function, role and examples.

A CPU (Central Processing Unit) is also known as the 'Brain of a Computer'.
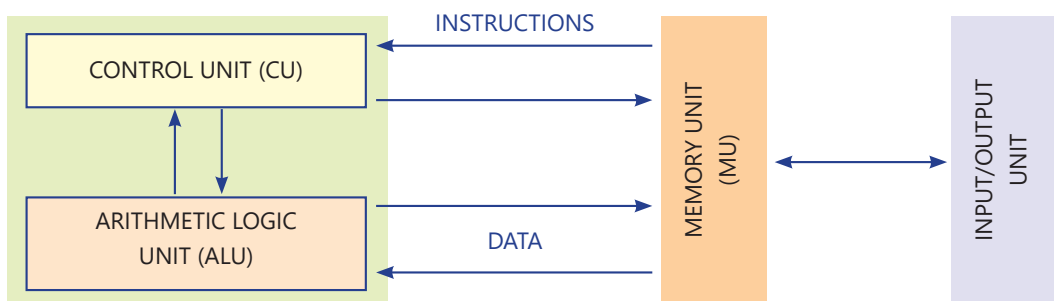


Define all the output devices in detail with proper function, role and examples.

Motherboard is the main circuit board of a computer that lies inside the CPU box to which all the hardware components are connected. It is in the form of a large multilayered printed circuit which contains connectors (sockets) for attaching additional devices.

SMPS is an electric regulator component that receives electricity from the main power supply and then supplies appropriate power to the other components of the computer. It supplies power (i.e.,

±3V to ±5V) to different devices inside the computer.

Ports are sockets that are used to connect external devices.

Cards are the devices that enable the user to configure or customise a computer to perform specific tasks or to enhance its performance.

Memory, in context to a computer system refers to the location of storage of information. The CPU stores the data in the memory/storage device that can be used or retrieved whenever required.
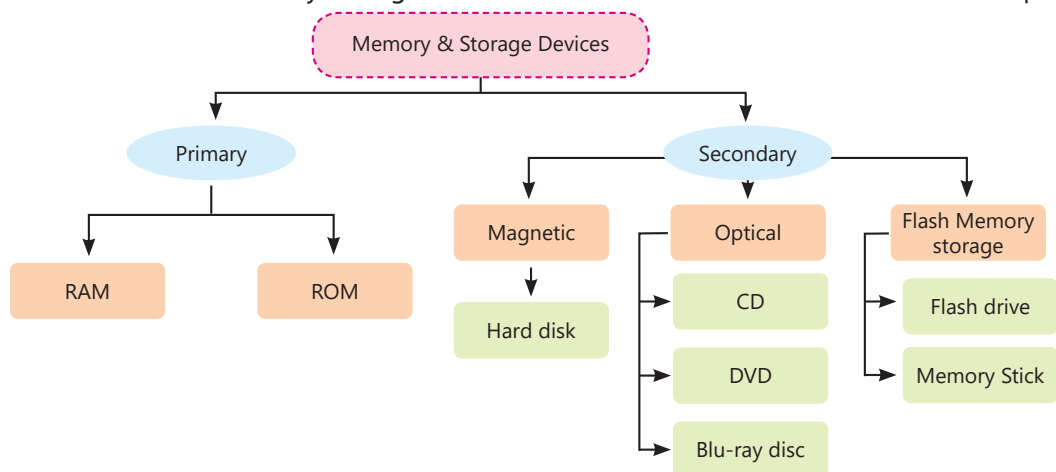


Storage of data is measured in multiples of bytes. Different units of storage of data are:

| No. of bits/bytes | Equal to |
| --- | --- |
| 8 Bits | 1 Byte |
| 1024 Bytes (B) | 1 Kilobyte |
| 1024 Kilobytes (KB) | 1 Megabyte |
| 1024 Megabytes (MB) | 1 Gigabyte |
| 1024 Gigabytes (GB) | 1 Terabyte |
| 1024 Terabytes (TB) | 1 Petabyte |
| 1024 Petabytes (PB) | 1 Exabyte |
| 1024 Exabytes (EB) | 1 Zettabyte |
| 1024 Zettabytes (ZB) | 1 Yottabyte |
| 1024 Yottabytes (YB) | 1 Brontobyte |
| 1024 Brontobytes (BB) | 1 Geopbyte |

A set of organised programs meant for specific purpose is known as 'Software'. Software is an intangible part of a computer which provides intelligence to the computer.
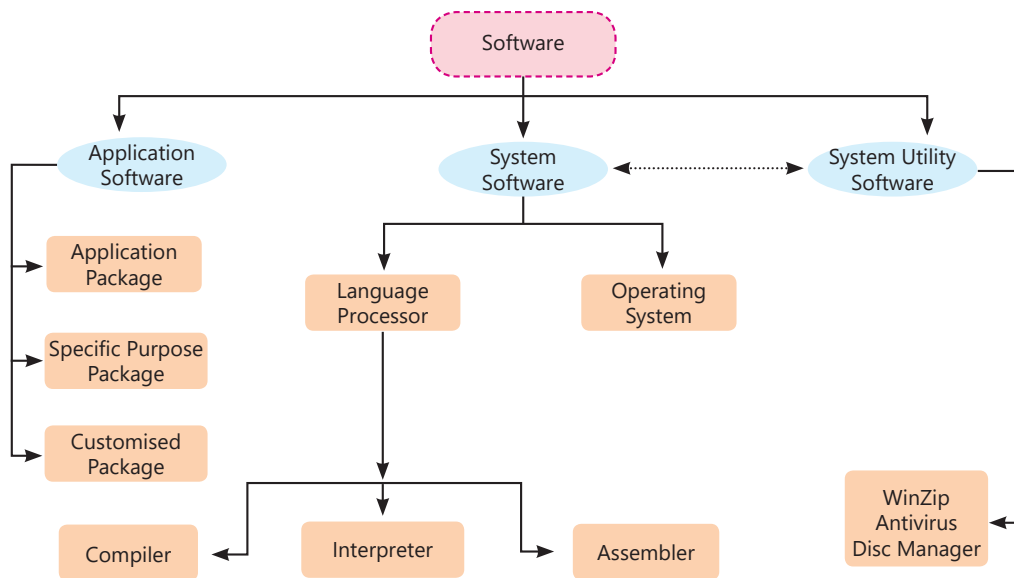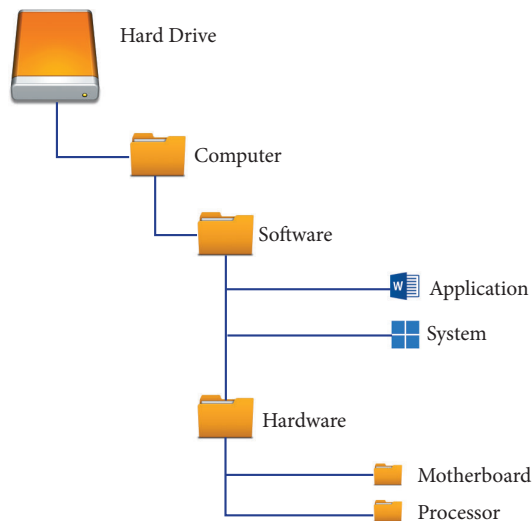


Describe all types of software to the students.

File System is the basic structure and concise format to arrange the set of information with their names.

Demonstrate the steps to check file system of hard disk.

The arrangement of the files in the form of folders is known as 'File Management'.



Demonstrate the steps to create, move, copy, rename, delete, restore a folder/file.

Windows provides the facility to view the properties of a particular file, like the date of its creation or modification, its size, etc.

A computer network is a link between two or more computers that are connected for the purpose of sharing of information and resources among themselves. There are several advantages of networking.

Based upon geographical area, networks can be classified into four broad categories:

- PAN
- LAN
- MAN
- WAN

Transfer of data for exchanging the information takes place through media can be broadly categorised into two types:

- Wired/Guided
- Wireless/Unguided

Explain the following terms to the students:

- Ethernet Cable
- Coaxial Cable
- Fiber Optics Cable
- Bluetooth
- Wi-Fi
- Infrared

Cloud computing refers to the usage of IT applications that are available on Cyber network but stored in a remote server. Some of the types of clouds are public cloud and private cloud.

Protocol refers to a set of common notions, norms or rules that coordinate or govern the functioning between two or more sets of computers or networks.

'Multi' means more than one or many and 'Media' means mode of communication. Thus multimedia means an integration of multiple media such as graphics, text, sound, videos, and animations in one set of file.

Also, define the components and uses of multimedia.

Chat Sites is a feature of Internet that enables instantaneous transmission of messages from the sender to receiver on Internet.

In computer, social networking refers to a network of several people interacting through computing device around the world on the internet. It is the network of people who form communities among themselves to share sentiments, relationships, ideas, topics of common interest, etc.

## Extension

Ask the students some oral questions based on this chapter.

Q.  Explain the following:

a.  Design of Computer
b.  Characteristics of a Computer
c.  Limitations of a Computer
d.  Communication Technology
e.  Components of a Computer System
f.  Memory & Storage Devices
g.  Units of Storage
h.  Software
i.  Computer Network
j.  Cloud Computing
k.  Protocols
l.  Multimedia
m.  Chat Sites
n.  Social Network

## Evaluation

After explaining the chapter, let the students do the exercises given on Pages 48 to 54 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

> **Unit-2: Cyber Safety**

# 2  Cyber Safety

## Teaching Objectives

Students will learn about

✦  Cyber Safety
✦  What Is Online Identity?
✦  How Websites Track your Online Activity?
✦  How to Protect your Privacy?
✦  Password
✦  Privacy
✦  Confidentiality of Information
✦  Cybercrime
✦  Malware
✦  Safety Measures to Prevent Malware

| Number of Periods ||
| Theory | Practical |
| --- | --- |
| 5 | 5 |

## Teaching Plan

**Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:**

Cyber safety is a measure to prevent or safeguard from cybercrimes or cyber attacks. It enables us to keep our personal information or data intact & secure and also protects organisations or individuals from unauthorised access or manipulation of information.

Online identity refers to the personal information, activities, and interactions that represent a person on the Internet, such as usernames, social media profiles, and email accounts.

Identity Protection refers to safety practices to prevent theft of personal information such as personal profile, bank account details, address details, family details and also to prevent from obtaining credit card benefits, ordered goods, passports, driving licenses, etc. by other person.

Websites track user activity to personalise content, improve user experience, and analyse traffic. Also, explain the following with proper examples:

- Cookies
- IP Address Tracking
- Session Tracking
- HTTP Peferrer
- Tracking Scripts
- User Agents

To protect your privacy online in the UK, it's important to clear cookies regularly or use incognito mode to ensure your browsing activity isn't saved on your device. You can also use privacy-focused browsers or install plugins that block tracking scripts and prevent third-party data collection.

Also, explain the following with proper examples:

- Protect Username and Password
- Do not share Personal Information
- Secure Online Transaction
- Avoid using Unsecured Wi-Fi
- Don't Accept Unknown Invitation
- Use Antivirus and Antispyware Software
- Clear Browser Cookies Frequently
- Install Firewall
- Never Install Software from Unknown Sources
- Data Stored in Web Browser

A password can be termed as a key of codes that protect our valuable content, documents or files. It helps us to keep many of our belongings or documents secure or secret. Also tell the students the tips for choosing a password and the negative impacts of choosing a wrong Password.

Privacy in Information Technology refers to personal control over one's own files and documents. It also refers to the right and ability to keep control over the information that one reveals or uploads over the internet.

Confidentiality refers to keep the data or information secret and allowing only authorised people to access the information. To protect sensitive data and ensure its confidentiality, it is essential to implement various best practices. Tell the students about these practices.

Cybercrime refers to misuse of data and resources on internet i.e., cyber stalking, identity theft, bank details theft, unauthorised access of computer or network (hacking), etc.

Cyber bullying is the act of harassing, threatening, or humiliating someone through digital platforms like social media, messaging apps, or online forums. It can include spreading false rumors, sending hurtful messages, sharing private information without consent, or posting offensive content to harm someone's reputation. Also, tell the students how they can protect themselves against cyber bullying.

Cyber stalking refers to the crime of using the Internet, e-mail, or other types of electronic communications to harass or threaten other people by following them online. Also, tell the students how they can protect themselves against cyber stalking.

In India, CERT-In (Indian Computer Emergency Response Team, Department of Electronics and Information Technology and Ministry of Communication & Information Technology) issues guidelines for preventing cyber-crimes on regular basis.

Tell the students that they can report incidents to CERT-In.

Malware refers to infectious programs that hampers the functioning of a computer system. It is unwanted software which is designed to damage a computer system. Some common types of malware are virus, worms, trojan horse, spyware, etc.

Explain them virus and its types. Also, tell them about different malware in detail.

There are many remedial measures with which we can fight the viruses, spyware and other malware. There is a popular saying that, "Prevention is better than cure".

### Extension

Ask the students some oral questions based on this chapter.

Q. Write a note on:

| | | | |
|---|---|---|---|
| a. | Cyber Safety | b. | Password |
| c. | Privacy | d. | Confidentiality of Information |
| e. | Cyber Stalking | f. | Cybercrime |
| g. | Malware | h. | Safety Measures to Prevent Malware |

### Evaluation

After explaining the chapter, let the students do the exercises given on Pages 71 to 78 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

## Unit-3: Office Tools

# 3 Working with Word Processor

### Teaching Objectives

Students will learn about

- ✦ Introduction to Word Processing
- ✦ Features of a Word Processor
- ✦ Introducing Openoffice Writer
- ✦ Working with Writer
- ✦ Editing Text
- ✦ Formatting the Document
- ✦ Bullets and Numbering
- ✦ Grammar and Spell Check
- ✦ Inserting Symbol
- ✦ Inserting Date and Time
- ✦ Inserting Pictures
- ✦ Borders and Shadows

- ✦ Tables
- ✦ Mathematical Expressions
- ✦ Some Common Shortcuts
- ✦ Track Changes
- ✦ Drawing Toolbar

| Number of Periods | |
|---|---|
| Theory | Practical |
| 3 | 16 |

## Teaching Plan

**Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:**

A word processing package is an application software that helps type text and create documents. It also helps in editing, formatting and printing documents.

Tell the students about the features of word processor:

- Editing
- Formatting
- OLE
- Find and Replace
- Interface
- Graphics
- Mail Merge
- Navigation between pages
- Spelling and Grammar
- Auto Complete

Introduce Open Office Writer to the students along with all the features in detail.

Explain working with Writer using labelled steps for:

- To create a new document
- To save a document
- To open an existing document
- To preview
- Typing text in a document
- To save a document with a new name
- To close a document
- To print a document

Making changes in the existing text is known as 'Editing'. After entering text in a document, the user may wish to modify the contents. Editing of a document involves modifying, inserting, deleting the selected text of a document.

Edit menu provides various editing options like Undo, Redo, Cut, Select, Copy, Paste, etc., which help in modifying the contents of a document.

'Inserting Text' means insertion of text in a document.

Copying means duplication of certain contents of a document by pasting the copy of selected content to some other location in or outside a document.

The 'Cut' option helps to remove or cut the selected text from its original place. It can then be pasted at the same place or at a new place in the same or a different document.

Undo is an option that helps to retrieve (bring back) previously made modifications in a document or reverse the previous action or a series of actions.

The 'Redo' option helps to reverse the changes which were applied by 'Undo'. It cancels the 'Undo' action.

Changing the appearance of text or document to make it more prominent, attractive and appear as per user's requirement is referred to as Formatting.

It includes character formatting, paragraph formatting, page formatting, etc. Appearance of characters in different styles can be applied with different styles of font.

OpenOffice Writer offers different text case options.

The Superscript option raises the selected text slightly above the baseline and reduces its size. The Subscript option places the selected text slightly below the baseline and also reduces its size.

Format Paintbrush is a tool which is used to apply the same type of formatting which is on a particular content; to some other content.

Paragraph formatting helps to change and modify the appearance of the paragraph. It helps to set parameters like text alignment, tab stops, line spacing, paragraph indentation, etc. Tell them all these parameters in detail.

Orientation refers to the layout of paper in which the document gets printed, i.e., Landscape and Portrait. In portrait, the page is printed lengthwise, i.e., from top to bottom whereas in landscape the page is printed width-wise, i.e., from side to side.

Margin is the gap between the edge and beginning of text i.e., the outer boundary of the text in a document beyond which the contents of the document do not flow.

Header and Footer is the mark of identification or reference of the text which is displayed on every page of a document.

Bullet/Number refers to the 'marks' which can be inserted in a document to highlight certain line or to distinguish some points of text in a document when different lines or paragraphs have to be identified or have to be shown separately.

Spell check is an additional feature in 'Writer', which helps to check the spelling of different words in a document in two ways:

- Auto Spellcheck
- Spelling and Grammar

In word processor viz. Writer, different types of symbols, special characters, date and time can also be inserted in a document to make it more informative and presentable.

You can insert the following in your document:

- Date and Time
- Pictures
- Border and Shadows
- Tables
- Autoformat
- Track Changes
- Mathematical Expressions

Explain to the students about drawing toolbar and fontwork gallery. Also demonstrate the steps to use it.

Explain some common shortcuts used in word processor:

| Shortcut | Description |
|---|---|
| Ctrl+O | Opens a document |
| Ctrl+S | Saves the current document |
| Ctrl+N | Creates a new document |
| Ctrl+P | Prints the document |
| Ctrl+Q | Exits the application |
| Ctrl+X | Cuts the selected items |
| Ctrl+C | Copies the selected items |
| Ctrl+V | Pastes from the clipboard |
| Ctrl+Shift+V | Opens the Paste Special dialog |
| Ctrl+A | Selects all |
| Ctrl+Z | Undoes last action |
| Ctrl+Y | Redoes last action |
| Ctrl+Shift+Y | Repeats last command |
| Ctrl+F | Calls the Find and Replace dialog |
| Ctrl+J | Align Justify |
| Ctrl+E | Align Center |
| Ctrl+F | Find and Replace |
| Ctrl+Shift+P | Superscript |
| Ctrl+Shift+B | Subscript |
| Ctrl+L | Align Left |
| Ctrl+R | Align Right |

## Extension

Ask the students some oral questions based on this chapter.

Q.  Write a note on the following:

a.  Features of a Word Processor

b.  Introducing OpenOffice Writer

c.  Working with 'Writer'

d.  Editing Text

e.  Formatting the Document

f.  Bullets and Numbering

g.  Grammar and Spell Check

h.  Inserting Symbol

i.  Inserting Date and Time

j.  Inserting Pictures

k.  Borders and Shadows

l.  Tables

|     |     |
|-----|-----|
| m. Track Changes | n. Mathematical Expressions |
| o. Drawing Toolbar | p. Some Common Shortcuts |

## Evaluation

After explaining the chapter, let the students do the exercises given on Pages 126 to 132 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

# 4 Working with Presentation

## Teaching Objectives

Students will learn about

- ✦ Presentation
- ✦ Features of Impress
- ✦ Slide Layouts
- ✦ Saving the Presentation
- ✦ Viewing the Presentation
- ✦ Editing and Formatting a Slide
- ✦ Presentation Package
- ✦ Beginning with 'Impress' in Computer
- ✦ Creating a Presentation
- ✦ Template
- ✦ Working with Slides

| Number of Periods | |
|---------|-----------|
| Theory | Practical |
| 2 | 10 |

## Teaching Plan

**Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:**

Presentation is a way of systematic display of information. It includes pictures, texts, graphics, audio, videos and animated objects which are organized and presented in a proper sequence.

The basic terms used in presentation:

- Slide
- Outlines
- Handouts
- Masters
- Speaker's Notes
- Slide Show

The software that is used to organize and display information through text, pictures, figures, etc. is known as a Presentation Package.

Explain the use, interface and features of Impress to the students.

Slide layout refers to the basic look or the frame of types of slides in which contents can be added.

In 'Impress', there are various types of predefined layouts for creating slides which can be used for creating a new presentation. Some frequently used layouts are Title Slide, Content, Title-Only, Blank Slide, etc.

To create a new presentation, click on the 'New' button from the Standard Toolbar.

A 'Presentation Wizard' dialog box appears with the following three options, each of which can be selected to make a new presentation:

- Empty presentation
- From template
- Open existing presentation

Demonstrate the steps to make a presentation using the above mentioned options.

A new presentation can also be made with the help of existing template in 'Impress'.

The presentation can be viewed in six different modes, i.e., Normal, Outline, Notes, Handout, Slide Sorter and Slide Show View. The mode of the view can be switched with each other by clicking on the view buttons that lie on the top of the workspace.

Explain the working, editing, and formatting on a slide to the students.

Explain how to add a watermark and a shape to the students.

### Extension

Ask the students some oral questions based on this chapter.

Q. Explain the following:

a. Presentation
b. Presentation Package
c. Features of Impress
d. Beginning with 'Impress' in Computer
e. Slide Layouts
f. Creating a Presentation
g. Saving the Presentation
h. Template
i. Viewing the Presentation
j. Working with Slides
k. Editing and Formatting a Slide

### Evaluation

After explaining the chapter, let the students do the exercises given on Pages 156 to 163 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

## 5 Effects in Presentation

### Teaching Objectives

Students will learn about

- ✦ Adding Multimedia Features in Slides
- ✦ Animation in Presentation
- ✦ Setting Timings for a Slide Show
- ✦ Grouping Objects
- ✦ Inserting Speaker Notes
- ✦ Printing a Presentation

## Teaching Plan

**Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:**

To make the presentation more effective and attractive, we can add multimedia features in the slides like:

- Inserting pictures
- Adding movie or sound

Animation facilitates the display of presentation of contents in a special sequence of typical effects leading to an interesting and a lively presentation.

Slide Transition sets the style of appearance of slides in a presentation. It is the effect applied when a slide changes to another during on-screen presentation or slide show.

Display of each slide in a presentation at a proper and specific time, (automatically by itself) makes the presentation more impressive. In 'Impress', it is also possible to set the timings between the display (or switching) of slides. One can set the timings of the slides that appear during a presentation in two ways:

Setting the time manually and Rehearse Timings

In Impress, different pictures and objects can be combined together to work and act as a single object. This process of combining the objects/pictures is known as 'Grouping'.

'Notes' view allows you to add reference or notes for your help to the slides in a presentation. In the notes view, the slides are displayed in a reduced form towards the upper side of the slides. At the bottom, a text box appears in which reference to the slide can be added.

Define the labelled step for the printing a presentation to the students.

## Extension

Ask the students some oral questions based on this chapter.

Q. Explain the following:

a. Adding Multimedia Features in Slides
b. Animation in Presentation
c. Setting Timings for a Slide Show
d. Grouping Objects
e. Inserting Speaker Notes
f. Printing a Presentation

## Evaluation

After explaining the chapter, let the students do the exercises given on Pages 173 to 179 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

# 6 Working with Spreadsheet

## Teaching Objectives

Students will learn about

- ✦ Features of a Spreadsheet Package
- ✦ Types of Data
- ✦ Entering Data in Sheet
- ✦ Saving a Spreadsheet
- ✦ Printing a Sheet
- ✦ Navigation
- ✦ Formatting Cells

- ✦ Introducing Calc
- ✦ Creating a Spreadsheet
- ✦ Moving in a Sheet
- ✦ Opening an Existing Spreadsheet
- ✦ Working with Spreadsheet
- ✦ Editing in Sheet
- ✦ Auto Fill

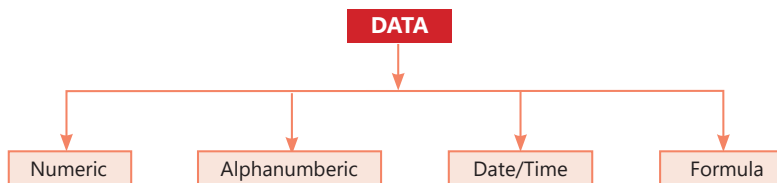| Number of Periods | |
|---|---|
| Theory | Practical |
| 2 | 13 |

## Teaching Plan

**Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:**

A spreadsheet package accomplishes such tasks quickly and efficiently. A spreadsheet package is an application software that analyzes data with the help of graphs and charts and does analysis, calculations, comparisons, etc.

Introduce Calc and explain the features of Calc to the students.
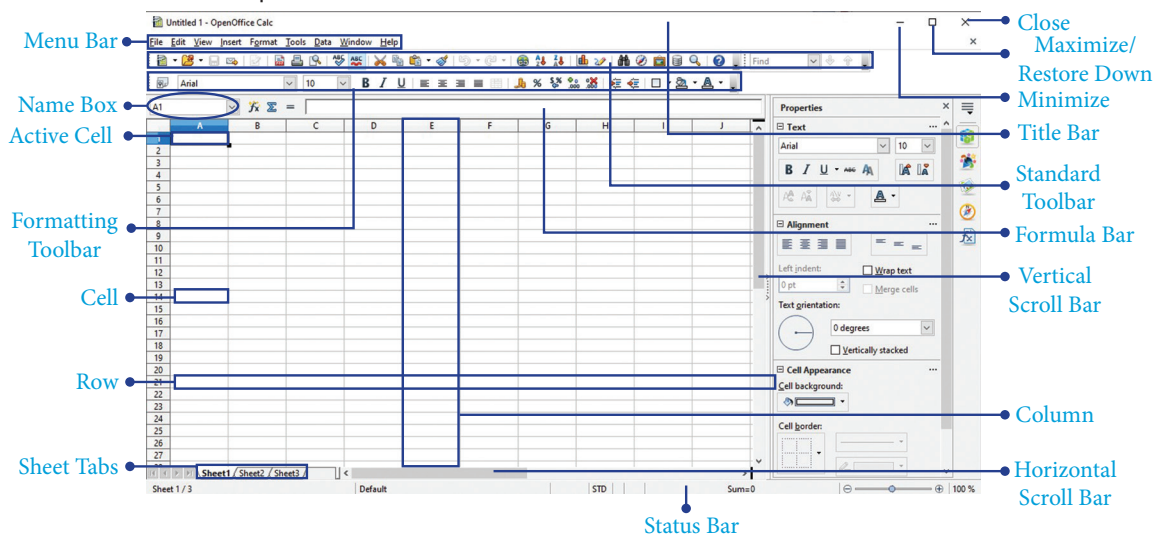


Based on which type of data is being stored, data can be classified into numeric, alpha-numeric or text, date/ time and formula.

```
                        ┌──────────┐
                        │   DATA   │
                        └────┬─────┘
                             │
        ┌──────────┬─────────┼─────────┬──────────┐
        ▼          ▼         ▼          ▼
   ┌─────────┐ ┌─────────────┐ ┌───────────┐ ┌──────────┐
   │ Numeric │ │Alphanumberic│ │ Date/Time │ │ Formula  │
   └─────────┘ └─────────────┘ └───────────┘ └──────────┘
```

'Calc' opens with a new Spreadsheet named 'Untitled 1' as the default workbook where the user can begin to work.

To begin entering the data, click on the cell. While typing, the data can also be seen in the Formula bar.

To work in 'Calc', commands or data have to be entered with the help of input devices like mouse and keyboard in different cells of the sheet. Also, tell them about the shortcuts that can be used in Calc.

If a spreadsheet is saved for the first time, it must be assigned with a new file name. Tell the students in detail about saving a spreadsheet, printing a spreadsheet, and closing it.

Explain the steps of the following to the students while working with spreadsheet:

- Adding a sheet
- Deleting sheet
- Renaming sheet
- Moving sheet
- Hide/Unhide sheet
- Navigation

Explain the steps of the following to the students while editing in Sheet:

- Modifying the cell content
- Inserting cells
- Deleting cells
- Cutting/copying and pasting the content
- Inserting rows and columns
- Deleting rows and columns
- Hiding columns
- Undo and Redo

Applying formatting in cells which includes:

- Font
- Color
- Alignment
- Autofill
- Custom list

## Extension

Ask the students some oral questions based on this chapter.

Q. Write a short note on the following:

a. Features of a Spreadsheet Package
b. Introducing Calc
c. Types of Data
d. Creating a Spreadsheet
e. Entering Data in Sheet
f. Moving in a Sheet
g. Saving a Spreadsheet
h. Opening an Existing Spreadsheet
i. Printing a Sheet
j. Working with Spreadsheet
k. Navigation
l. Editing in a Sheet
m. Formatting Cells
n. Auto Fill

## Evaluation

After explaining the chapter, let the students do the exercises given on Pages 203 to 208 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

# 7  Data Analysis
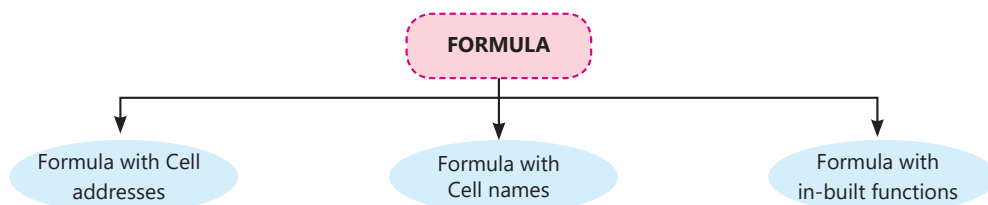
## Teaching Objectives

Students will learn about

- ✦ Formulas
- ✦ Operator
- ✦ Common Errors
- ✦ Filter

- ✦ Cell Referencing
- ✦ Entering a Function in a Cell
- ✦ Sorting
- ✦ Charts and Graphs

| Number of Periods ||
|---|---|
| Theory | Practical |
| 1 | 10 |

## Teaching Plan

**Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:**

Formulas can be applied on a large data set to perform various mathematical operations such as addition, subtraction, division, multiplication and many more.

```
                        FORMULA

Formula with Cell      Formula with       Formula with
   addresses            Cell names      in-built functions
```

The identification or address of a cell in a formula is known as a 'Cell Reference'. There are three types of referencing in 'Calc'.

- ● Relative Referencing
- ● Absolute Referencing
- ● Mixed Referencing

An operator is a symbol that performs certain mathematical or logical operations. In a cell, the calculation takes place in the order of precedence of operators (in a similar way as BODMAS in mathematics).

Sometimes when we use wrong type of data, operand or operator in a formula, then error message gets displayed. Given below is the list of errors which commonly occur in 'Calc'.

| Errors | Reasons |
|---|---|
| ### | Occurs when the cell contains a number, data or time that is wider than the cell width or when the cell contains a date and/or time formula that produces a negative result. |
| #VALUE! | Occurs when a wrong type of argument or operand is used. |
| #NAME? | Occurs when a function name is typed incorrectly, a named range is undefined, quotation marks for text are misused, or an undefined constant or function is used. |
| #NUM! | Occurs when there is an invalid numeric operation, such as performing calculations on out-of-range numbers, taking the square root of a negative number, or dividing by zero. It can also happen if the result is too large or too small. |
| #REF! | The formula within the cell uses a reference that does not exist. Either a column or row description name could not be resolved, or the column, row, or sheet that contains a referenced cell is missing. |
| #DIV/0! | Occurs when a formula is divided by zero. |

Sorting refers to the process of arranging data in ascending or descending order based on a certain criterion.

Filtering is a quick and easy way to get required information from the subset of data in a range of cells. A filtered range displays only such data that meet the criteria as specified for a field. In 'Calc' there are three options that help in filtering the range of data:

| AutoFilter | It filters data according to specific value or string. |
|---|---|
| Standard Filter | It filters the data according to a given condition. |
| Advanced Filter | It does more advanced filtering, on the basis of specific criteria. |

In spreadsheet package, there are additional features that help to represent information in the form of charts and graphs. It is a visual or graphical representation of data from a worksheet which is very useful for instant analysis and decision making.

| X-Axis | It is the horizontal axis known as category axis. |
|---|---|
| Y-Axis | It is the vertical axis and is known as value axis. The X and Y axis divide the X-Y plane into four quadrants. |
| Data series | It is the set of values which the user wants to plot in the chart. |
| Chart Area | It refers to the total area surrounded by the chart. |
| Plot Area | It is that area of the chart in which the data is plotted. In a 2-D chart; axis bound the plot area whereas in 3-D charts, walls and floors bound the plot area. |

| | |
|---|---|
| Chart Title | It is the heading text that helps to identify the chart. |
| Axis Title | It refers to the titles given to three axis, i.e. X, Y and Z axis. |
| Legend | It helps to identify the plotted data series. Unique colour or pattern is helpful to identify such series. |
| Gridlines | It refers to the horizontal and vertical lines in the plot area. The gridlines are inserted in the chart to enhance its readability. |
| Data Label | It refers to the label that provides additional information about data marker, thus representing a single data item or value of a cell. |
| Walls and Floors | In a 3-D chart, the base area or the plane in X-Y axis is called the floor and the vertical areas, i.e. planes in X-Z and Y-Z axis are called walls. |

Explain the types of chart:

- Line chart
- Column chart
- Bar chart
- Pie chart
- X-Y (Scatter) Chart
- Area chart

Demonstrate the steps to make a chart.

## Extension

Ask the students some oral questions based on this chapter.

Q.   Write the short note on:

    a.   Formulas
    b.   Cell Referencing
    c.   Operator
    d.   Entering a Function in a Cell
    e.   Common Errors
    f.   Sorting
    g.   Filter
    h.   Charts and Graphs

## Evaluation

After explaining the chapter, let the students do the exercises given on Pages 229 to 235 in the main course book as **Solved Exercise** and **Unsolved Exercise**.