

Topic 1: Computer - Hardware Components

Computers comprise of two major components: hardware and software that are integral to each other's functioning. Hardware are either external, like, monitor, keyboard, mouse, printer, etc., or internal, like, CPU, motherboard, drive, sound card and video card. This theme aims at enabling children to know and understand the two major components of the computer.

Learning Outcomes:

Children will be able to:

- ☑ recognize different components of a computer like SMPS, ports, MODEM and disc drives.
- ☑ explain the usage of different components.
- ☑ differentiate between external and internal hardware.
- ☑ cite examples of external and internal hardware.

Computer – Hardware Components

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
➤ Computer Hardware: external and internal hardware; ➤ Brief explanation with examples of hardware and some of its parts (CPU, Disk drives, Power supply (SMPS), Motherboard, Ports, Modem, peripheral devices (keyboard, mouse, pen drive, scanner, printer etc.).	➤ Showing the components of an old CPU box and their placement on the mother board. ➤ Differentiating through demonstrations to children between internal and external hardware. ➤ Explaining different components like Power supply (SMPS), Motherboard, Ports, Modem through presentations/ videos. ➤ Engaging children to participate in quizzes and worksheet activities related to hardware	➤ Old CPU components. ➤ Computers/ IWB with presentation software. ➤ External hardware. ➤ Internal hardware, ➤ Quizzes and worksheets

Topic 2: Number System – An Introduction

Number System is a set of values used to represent different quantities. In day-to-day life we use the decimal number system, which has a base of 10 as it uses 10 digits (0-9). The digital computer represents all kind of data and information (text, numbers, graphics, video, etc.) in binary numbers which have a base of 2 as the computer uses 2 digits (0 and 1). Other number systems used in computer are octal and hexadecimal. Values from one number system can be converted to other number system. This theme aims at enabling children to know and understand the different number systems and their uses in general and in particular that of the digital computer.

Learning outcomes:

Children will be able to:

- ✓ explain the need for Number Systems;
- ✓ list the uses of various Number Systems in computer learning;
- ✓ convert a value from decimal number system to binary and vice versa;
- ✓ citing examples of binary, decimal conversion and demonstrating them.

Number System – An Introduction

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
▷ Introduction to Number system: need for number systems and examples of various number systems. ▷ Digits and bases of different number systems. ▷ Represent value in different number systems (Decimal, binary, octal and hexadecimal number system). ▷ Conversions from decimal to binary and vice versa.	▷ Illustrating to children the various number systems (Decimal, binary, octal and hexadecimal) through videos/ presentation. ▷ Providing opportunities, through examples to children to undertake hand-on-activity for practicing the technique of conversion binary to decimal and vice versa.	▷ Computers/ IWB with presentation software. ▷ Hands-on-activity ▷ Interactive class ▷ Videos on number systems. ▷ Projector, etc.

Life Skills: Such as logical thinking may be developed through this content.

Topic 3: Computer Virus

A computer virus is a 'piece of code' that copies itself and corrupts the system to destroy existing data on a computer. Computer viruses are manmade. There are many types of viruses which infect systems in different ways causing damage to the system. To counter-effect the virus, antivirus programs are developed. This Topic aims at developing children's ability to understand and discuss about what a computer virus is the different types, symptoms and causes along with remedies and protection tips.

Learning outcomes:

Children will be able to:

- ✓ define a virus.
- ✓ list different types of viruses.
- ✓ follow standard measures to prevent virus attack.
- ✓ identify symptoms of virus attack on a computer.
- ✓ use a suitable antivirus software.

Computer Virus		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
➤ Definition and example of computer virus. ➤ Types of Virus (boot sector and program file virus - definition and examples). ➤ Virus symptoms and harm caused by virus ➤ Antivirus – definition and examples. ➤ Ways to prevent a virus (e.g. scanning pen drive, and CDs, downloading only from secured sites, updating of antivirus regularly etc.). ➤ Definition and example of forms of virus attack (malware, worm, spyware, Trojan horse, sweeper).	➤ Illustrating different types of viruses (boot sector and program file virus with examples). ➤ Discussing the different forms/types of viruses. ➤ Showing children through videos/ presentations the symptoms and harm caused by viruses and conducting a discussion with them after that. ➤ Demonstrating different ways to prevent virus attacks and asking children to replicate the same.	➤ Computers/ IWB with presentation software. ➤ Videos. ➤ Discussion on harmful effects of virus ➤ Scanning process of pen drive, CD

Life Skills: Awareness and Management skills

Topic 4: Ethics and Safety Measures in Computing

Ethics in computing or computer ethics is a set of moral principles which regulate the use of computers. This theme aims at making children aware of the ethics in computing while using the Internet. Further, in order to safeguard the computer and prevent attacks of viruses and hacking, etc. they will know about certain safety features which need to be applied.

Learning outcomes:

Children will be able to:

- ✓ follow ethics in computing;
- ✓ identify online threats;
- ✓ identify positive and negative uses of social media;
- ✓ show responsible behaviour when using computer and internet;
- ✓ become responsible digital citizens;
- ✓ take care about the digital footprint being created by their online behaviour;
- ✓ use information ethically when developing presentations/ projects/ etc.

Ethics and Safety Measures in Computing

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
▷ Advantages and disadvantages of using internet. ▷ A brief introduction to ethics in computing. ▷ Unethical practices prevalent in the society, related to internet: • Plagiarism • Cyber bullying • Hacking • Phishing • Spamming • Individual right to privacy • Software Piracy, • Intellectual property rights ▷ Meaning and a brief explanation of the different unethical practices stated above in point no. 3. along with the preventive measures. ▷ Safety Measures to be taken while using the computer and internet. Parental assistance for minors, such as- viewing age appropriate websites, keeping strong password, not sharing passwords, frequently changing passwords, responding to emails only from known person or organisation etc. Protection using Firewall (meaning and a brief explanation). ▷ Digital footprints (meaning and sensitising children about it.)	▷ Discussing with children various Topic/Topics related to ethical and non-ethical issues and practices on the Internet. ▷ While working on the computers inculcating, among the children, the habit of ethical online conduct and responsible behavior while using information and technology. ▷ Encouraging children to follow safety measures while using the computer and internet. ▷ Citing examples from real life to sensitise children on the implications of the digital footprint created by their posts, comments, pictures, social groups, etc.	▷ Computers/ IWB with Presentation Software. ▷ Videos. ▷ Discussion on ethical and unethical practices related to internet use

Life Skills: Net Safety, Social intelligence, work ethics and interpersonal skills.

Topic 5: Spreadsheets - An Introduction

A Spreadsheet is an interactive computer application for storing data, in a tabular form (in rows and columns of a grid), that can be manipulated and used for calculations. Spreadsheets are one of the most popular uses of computer. This Topic aims at developing children's understanding about the basic components and operations of the Spreadsheet, namely: creating/ saving/ modifying a workbook.

Learning outcomes:

Children will be able to:

- ✓ define a spreadsheet;
- ✓ list the features and components of a spreadsheet;
- ✓ create a worksheet;
- ✓ identify the components of spreadsheet window;
- ✓ differentiate between a workbook and a worksheet;
- ✓ edit/format a worksheet.

Spreadsheets – An Introduction

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
▷ Features of spreadsheet and its advantages. ▷ Components of Spreadsheet window: workbook and worksheet, sheet tab, cell, cell address, active cell, formula bar, row, column, name box. ▷ Entering data in a spreadsheet ▷ Types of data (number, string and formula). ▷ Perform calculations. ▷ Enter simple formulae. ▷ Select cells. ▷ Change cell contents. ▷ Use Undo and Redo features. ▷ Insert and deleting columns and rows. ▷ Copy and move data. ▷ Use autofill feature.	▷ Demonstrating to children the different components of a spread sheet along with discussion. ▷ Demonstrating the use of Spreadsheets using real life examples: children can be individually/in groups asked to collect data of a group of people on two- three criteria (e.g. age, height, weight, etc.), enter the data on a spread sheet and perform the various functions on them. ▷ Using formatting features by children created on the spread sheets. ▷ Discussion on advantages of spreadsheet and workbook. ▷ Providing each child the opportunity to work on computers and undertake the following tasks: • Entering data in a spreadsheet • Perform calculations. • Enter simple formulae. • Select cells. • Change cell contents. • Use Undo and Redo features. • Insert and deleting columns and rows. • Copy and move data. • Use autofill feature.	▷ Computers/ IWB with spreadsheet software. ▷ Questionnaires/survey s/ polls ▷ Discussion on advantages of spreadsheet and workbook

Life Skills: creative thinking, analytical and deductive skills

Integration: Mathematics

Topic 6: Database and DBMS – An Introduction

Database is an organised collection of data. DBMS, an acronym for Data Base Management System, is an application software for creating and managing databases. It provides facility to create, update, retrieve and manage data. In this topic children will know and understand about the basics of creating a database and will develop the ability to design simple query statements.

Learning outcomes:

Children will be able to:

- ✓ define database and DBMS;
- ✓ list real life examples of databases;
- ✓ design a database;
- ✓ describe different data types;
- ✓ define a primary Key;
- ✓ create a table, insert data, save and edit a table;
- ✓ build query statements.

Database and DBMS – An Introduction

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
▷ Meaning of Database and DBMS. ▷ Uses of database with examples. ▷ Create and Save a database. ▷ Primary Key. ▷ Querying a Database.	▷ Organising a discussion with children to cite examples from real life, like, telephone directory, student registration records, etc., highlighting the need to store data in an organised manner. ▷ Explaining the concept of database and illustrating steps to create, save and edit a database and querying a database. ▷ Explaining the importance of Primary Key and different data types with respect to database Query. ▷ Provide opportunities for hands on experience to prepare a database through some examples and generating queries on the data.	▷ IWB with database software. ▷ Telephone directory. ▷ Student registration record.

Topic 7: HTML – Advanced Features

This topic will develop children's ability to create a web page by not only using basic HTML tags, but upgrading their skills to use advanced tags like lists, images, links, tables and forms. This will make the creation of a web page more attractive and useful to children.

Learning outcomes:

Children will be able to:

- ☒ add advanced features to a web page, like lists, images, links, tables and forms

HTML – Advanced Features		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
▶ Create lists (,). ▶ Insert Images in web pages . ▶ Insert links <a href>, tables <tr>, <td>, <table>. ▶ Display objects through <Marquee>. ▶ Create forms using <form> tag.	▶ Revising and revisiting previous concepts learnt by children i.e. The HTML tags and building on the same. ▶ Encouraging children to discuss: • about the features of the websites that they like and their reasons for the same. • how a webpage can be made more impressive/user friendly. ▶ Illustrating how to create lists, insert images, links, tables and forms in a web page and encouraging each child to do the same on his/her computer. ▶ Providing opportunities for hands on activity through web page development.	▶ Computers/ IWB with HTML editor. ▶ Internet facility.