

Computer Masti

First edition 2013

BOOK

VIII





TM

Powered By: ™



A Collaborative product from IIT Bombay & InOpen Technologies

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First Edition: 2013

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Computer Masti

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About This Book

This book has evolved out of contributions from many authors, bringing together a variety of creative ideas. The salient features of this book are:

- The book is based on a detailed computer science syllabus that has been reviewed by many experts. This syllabus is available for download from www.computermasti.com.
- Establishing clarity of thought and developing computer fluency is the main objective of Computer Masti.
- Fun is an important element of learning.
- The lesson contents are woven around interactions between an imaginary teacher and two students. The teacher mostly asks questions that guide the students to discover and learn topics on their own. It is not expected that the teacher does a role play to recreate the story in the class. Rather, the narrative style is adopted to facilitate reading and consequently learning by the student.
- Each lesson focuses on specific concepts and associated skills. These concepts are selected such that: (i) They lay a strong foundation for learning computers. (ii) They contribute towards general intellectual development, and (iii) They are age appropriate.
- The Worksheets and Activities are designed in such a way that they supplement topics being covered in other subjects, to the extent possible. Group activities are included in each lesson to encourage collaborative learning. Projects are also suggested to reinforce the learning of topics across multiple lessons.
- 21st century skills of critical thinking, collaboration, communication and creativity are addressed in the lesson content and supplementary activities.
- This book includes a lesson that requires students to apply a combination of thinking skills and office and Internet applications. It is expected that having studied with Computer Masti for eight years, students would be able to work independently on these tasks.
- The book meets the standards suggested for continuous and comprehensive evaluation (Right to education). It equips the students with skills expected at the Problem Solving Assessment (PSA) test at Grade IX by the NCERT.
- The lessons and activities are based on free and open source software. The Computer Masti Toolkit (in the CD) is easy to install on commonly used operating systems.
- The book includes child friendly illustrations that are sensitive to body image and gender issues.
- Each Lesson has a Teacher's Corner section, which gives a lesson plan outline, some dos and don'ts, and pointers to when each worksheet has to be given to students.
- Emphasis of healthy computer practices, including SMART PLUS rules for Social Networking in particular and Internet safety in general are addressed through posters. You can put these on the display boards to serve as quick reference and memory trigger for the students.
- The online (e-book) version is available freely for individual use, under the conditions described earlier in the Copyright Statement. You may download it from: www.computermasti.com.
- Comments on the book and suggestions may be sent to Sridhar Iyer (sri@iitb.ac.in).

Acknowledgements:

We are thankful to Sahana Murthy for reviewing this book and participating in discussions at various stages. We are grateful to IIT Bombay for support during the creation of this book. Last but not the least, the teachings of Sri Sri Ravishankar have been a major source of inspiration for this book.



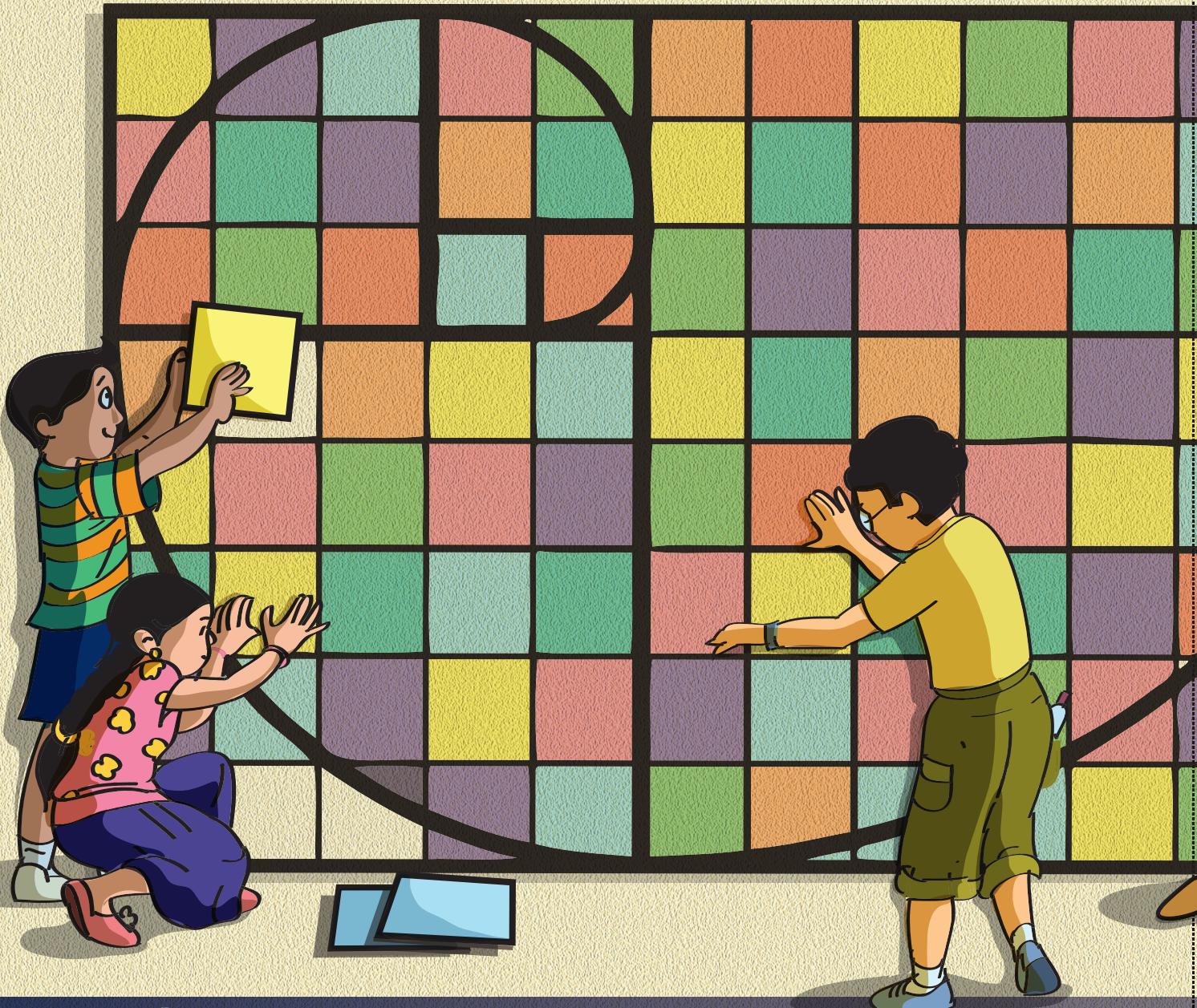
How To Use This Book

This book is meant to be used for teaching computers to children in the Seventh standard, in a way that is mostly fun (as indicated by the “Masti” in the title). It is designed so that it can be covered comfortably in one year, with one class (30 to 45 minutes) per week. A weekwise schedule of topics is given below.

| Lesson No: | Topic Name | Concepts | Skills | Weeks |
|------------|--|---|---|-------------------------------------|
| 1 | Revision | <ul style="list-style-type: none"> o Operating systems o Digital story creation o Cloud computing o Sorting spreadsheet data o FOSS o Repetition of instructions o Controlling execution of a program o Arrays in programming | <ul style="list-style-type: none"> o Booting and exploring computer hardware and software o Editing images o Inserting multimedia files in slides o Email management : group mails, search, sharing of content o Sorting spreadsheet data based on given criteria o Drawing charts and using functions in spreadsheets o Installing open source applications o Writing syntax based programs using o Repetition and control structures | 1 st -2 nd |
| 2 | Inside Internet | <ul style="list-style-type: none"> o LAN (Local Area Network) o Packet switching o WLAN(Wireless Local Area Network) o WAN(Wide Area Network) o Client server network o Firewall o Data and website security | <ul style="list-style-type: none"> o Setting up and connecting the various components for a LAN o Enabling software firewall o Using data security features on Internet sites | 3 rd -5 th |
| 3 | Social Networking | <ul style="list-style-type: none"> o Social Networking | <ul style="list-style-type: none"> o Using features provided on Social Networking Sites (SNS) o Following SMART PLUS and AWARE rules while using SNS | 6 th -8 th |
| 4 | Writing Blogs and Creating Websites | <ul style="list-style-type: none"> o Blogging o Front end and Back end of websites | <ul style="list-style-type: none"> o Creating Blog sites and publishing them with content o Creating simple websites using online tools | 9 th -11 th |
| 5 | Innovation and Creativity: Integrated Activities | <ul style="list-style-type: none"> o Information: gathering and analysis o Logical reasoning o Decision Making o Multiple ways of Categorisation | <ul style="list-style-type: none"> o Applying thinking skills to complete an activity o Using Office tools and Internet skills to perform an activity | 12 th - 14 th |
| 6 | Binary Number System: Bits and Bytes | <ul style="list-style-type: none"> o Binary Numbers | <ul style="list-style-type: none"> o Converting words to corresponding Binary code | 15 th |
| 7 | System configuration and Troubleshooting | <ul style="list-style-type: none"> o Software Repository o User Privileges o File Permissions o Backup data o Plug and Play devices | <ul style="list-style-type: none"> o Locking the screen and unlocking with passwords o Installing and launching applications o Setting up user privileges o Sharing and protecting files o Troubleshooting hardware and applications o Monitoring systems and processes | 16 th - 19 th |
| 8 | BASIC | <ul style="list-style-type: none"> o Conditional control of loop statements o Subroutines o String functions | <ul style="list-style-type: none"> o Writing simple algorithms o Writing programs using conditional control, subroutines and string functions | 19 th - 21 st |
| 9 | Introduction to Database and DBMS | <ul style="list-style-type: none"> o Database o Database Management System (DBMS) o Primary Key o Query of database | <ul style="list-style-type: none"> o Creating a Database o Creating a table o Inserting data into table o Building query statements o Defining relationship between tables o Using Forms and Reports | 22 nd - 24 th |

Interactivity is the key to success with these lessons. In the class, ask the students questions, and let many students answer each question. Ensure that the conceptual understanding is mastered before proceeding to the skills. In the computer lab, if they are doing activities in groups, ensure that they switch “drivers” frequently, so that each student gets to do a fair amount of the activities. Use the Group Activities and Projects suggested to stimulate creativity and encourage knowledge sharing.





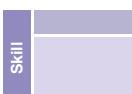
Legends

Aim:

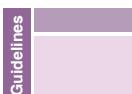
Lists the topics covered in the lesson.



Concept discussed in that section of the lesson is explained.



Step by step instructions to do a task (on the computer) in the application being discussed.



General recommendations that help to achieve a certain goal.



Information and/or additional details about a skill or concept.

Examples

Gives examples of concepts.



Gives pointers to the teacher on how to teach the lesson.



Gives pointers to the parents to guide their children.



Pages with this icon has Activities, which reinforces student's learning.



This icon points to a list of websites that can be referred for self learning.



Points to the footnote which provides, brief description of the concept learned earlier.

Contents

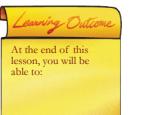
| Sr. No. | Name of the lesson | Page No. |
|---------|--|----------|
| 1. | Revision | 1 |
| 2. | Inside Internet | 9 |
| 3. | Social Networking | 27 |
| 4. | Writing Blogs and Creating Websites | 45 |
| 5. | Innovation and Creativity: Integrated Activities | 57 |
| 6. | Binary number system: Bits and Bytes | 69 |
| 7. | System configuration and Troubleshooting | 75 |
| 8. | BASIC | 97 |
| 9. | Introduction to Database and DBMS | 109 |



 Pages with this icon has Worksheets; that test extent to which learning objectives of the lesson are attained.

 After class collaborative activities to be presented later in the class for discussion and/or review.

 Lists tasks students can do to gain additional knowledge on the topic of the lesson.

 Lists the expected measurable learning objectives to be attained by the student after learning the topic.

Black Italic text Search Keyword, examples and Websites address.

Bold black text New word introduction.

Bold Orange text New Technical term introduction.

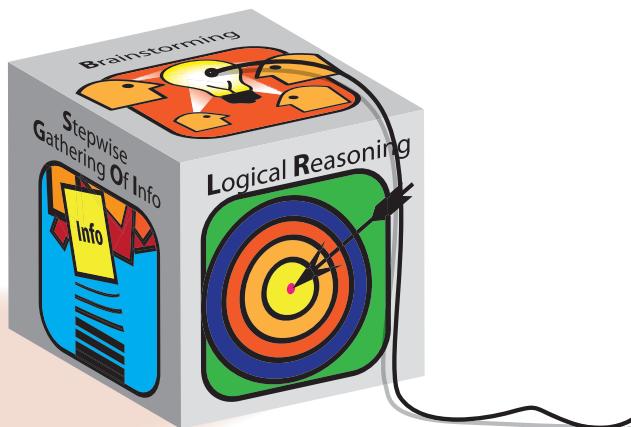
Revision

Aim: In this lesson, you will learn:

- To recall and apply the thinking skills and good practices that were covered in previous Computer Masti books.



The school computer teachers are attending a training program. Hence, Class VIII students are asked to take substitute classes for Grades V to VII. They decide to create interesting games, so that they can revise some of the topics with students of lower classes. Tejas and Jyoti are to go as a substitute teacher to Grade 6. They have to create teaching aids for this class. They decide to design games that can be used as activities in the class. Let us do it together!



- 1. Thinking Cube:** Do a paper folding activity to create a cube. Write names of different thinking skills on each facet (see fig. 1). This cube is ready to be used as a dice in a play. Ask questions related to the thinking skill on the top facet. Prepare a list of questions on each of the thinking skills.

For example:

- List the steps involved in gathering information systematically.
- What is the difference between main steps and detailed steps?
- List the steps to apply logical reasoning to solve a given problem.

(refer: <http://www.toolsforeducators.com/dice/>)

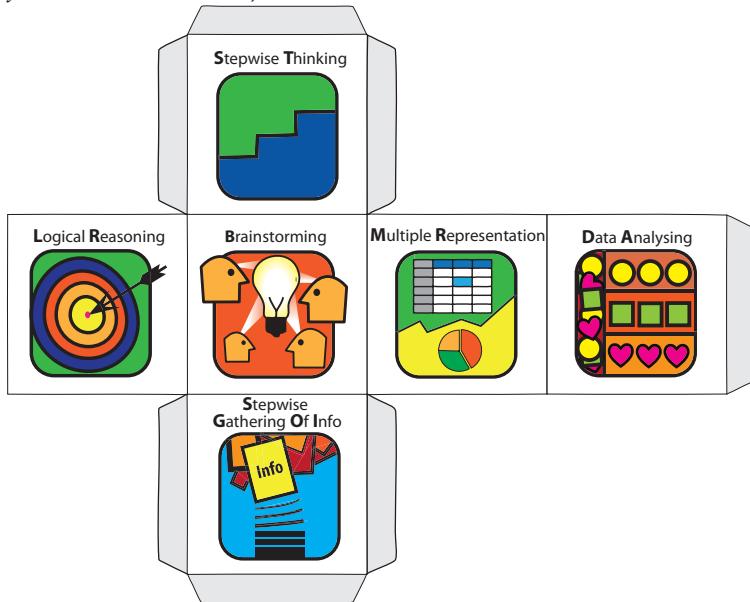


Fig.1 Cube - Paper folding

- 2. Computer Masti Dice:** Create five cubes (see fig. 2) in different colours. Each cube is color coded to represent one of the topics that students learnt in Computer Masti and has question on the topic. The orange cube could have questions on various computer parts and peripherals, the purple cube could contain questions associated with various tools and office applications. The green cube could contain questions on Internet, yellow cube could contain questions on how thinking skills are applied while working on particular applications, and the blue cube could contain questions on programming concepts.

(refer: <http://www.thinkingdice.com/>)

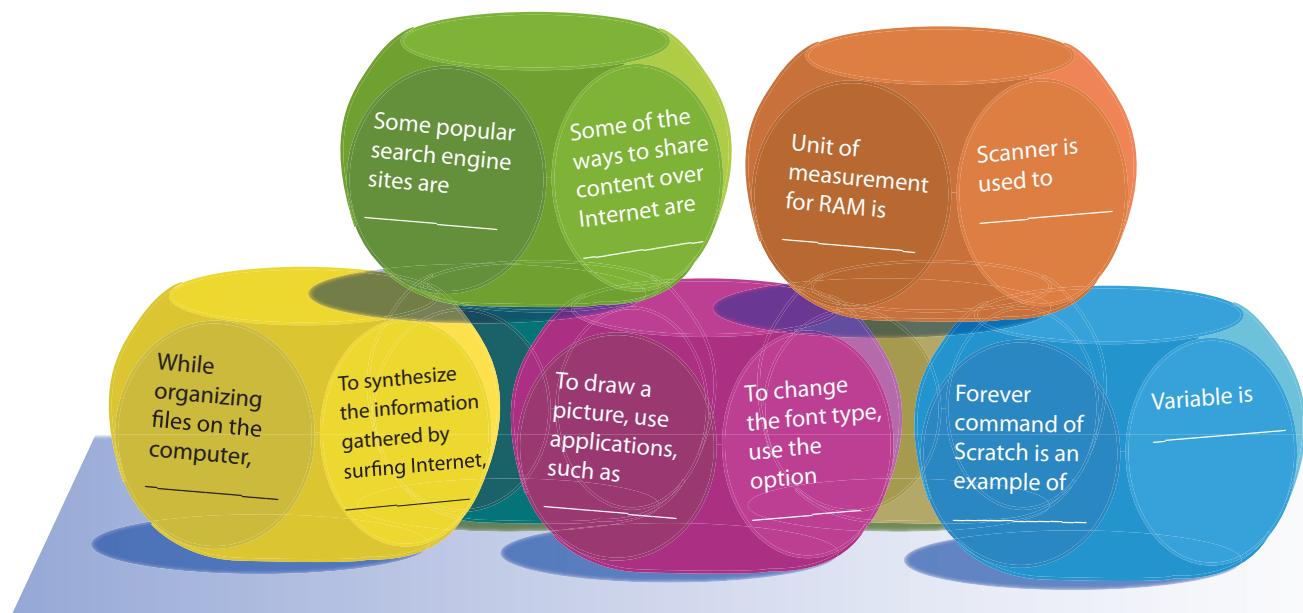


Fig.2 Examples of questions: (to be written on the dice)

3. **Paper Chatter Box:** Create a paper chatter box as shown below.

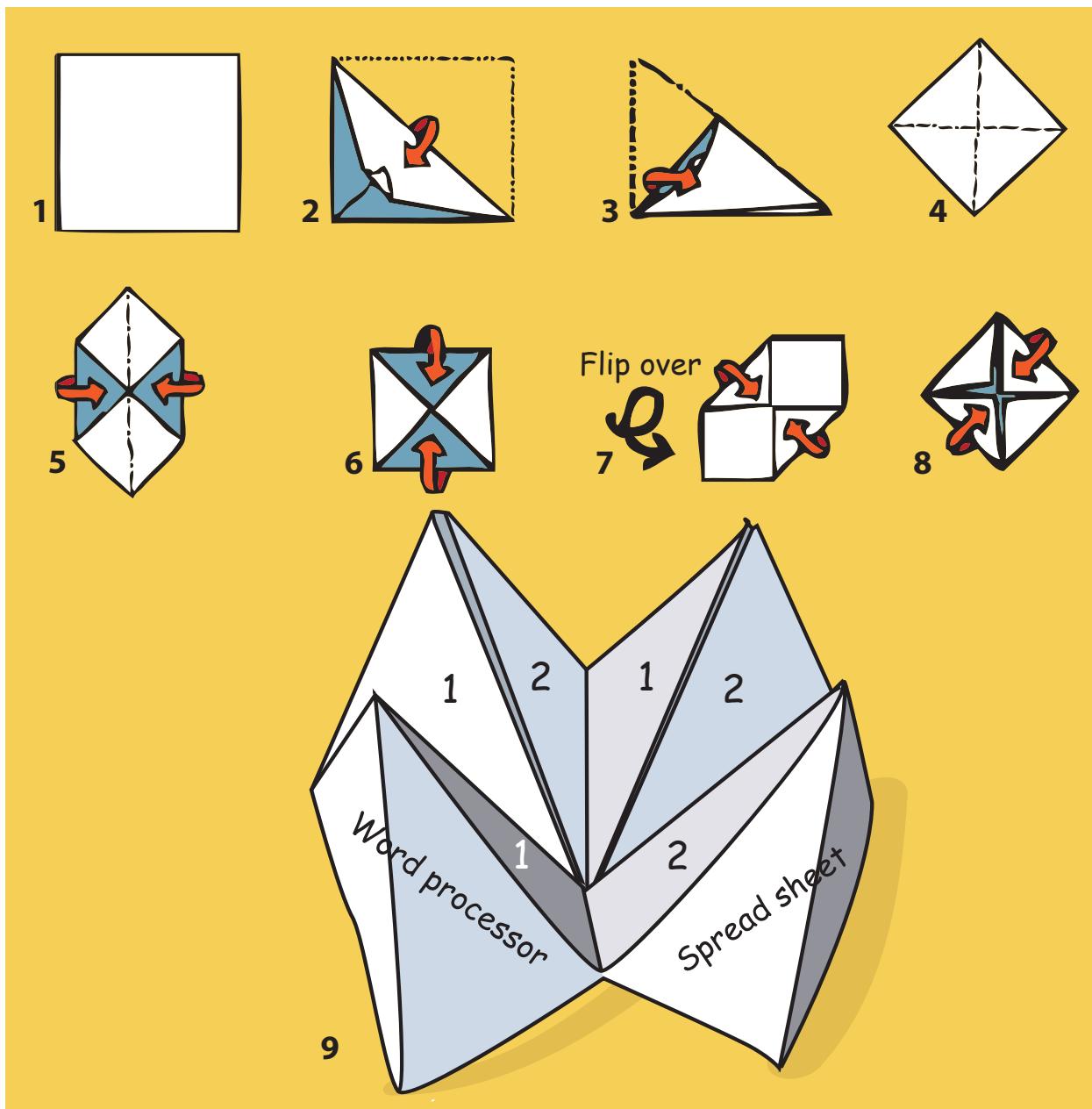


Fig.3 Steps for paper chatter box

Play the game of chatter box to revise the knowledge of various applications. On the front, write names of applications - word processor, spread sheet, presentation, and Internet. On the inside, write numbers 1/2 alternatively - 1 stands for names of alternative software and 2 stands for purpose of using the application. Further inside, you can write answers to the questions written for 1 and 2. (see fig. 3)

(refer: <http://ausweb.scu.edu.au/aw01/papers/refereed/turner/paper.html>)

4. **Safe and Correct use of Internet:** Refer the SMART rules of Internet safety and AWARE rules for responsible use of Internet resources. Create questions or scenarios (see fig. 4) to discuss each point covered in the poster. Encourage students to give their point of view on each point.

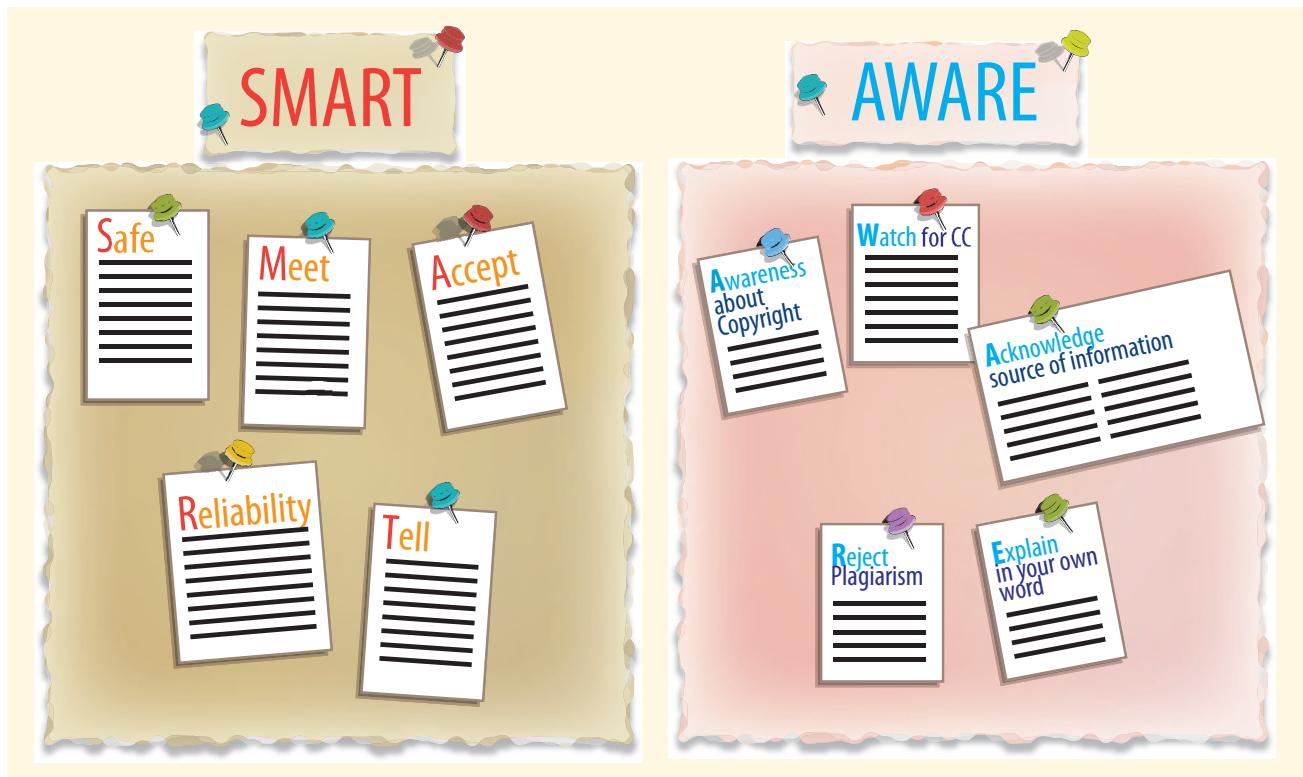


Fig.4 Questions/scenarios for discussion

5. **Healthy practices - Debate:** Form two separate teams and conduct a debate competition. One group advocates use of asanas for different body parts as they have learnt in Computer Masti. The second group argues for using alternative exercises (rather than asanas) for preventing computer injury. After 10 minutes, there is role reversal and the two groups exchange their roles. At the end of the activity. Summarize the importance of following healthy computer practices. Show posters of correct posture and various asanas that Computer Masti has taught the students (Refer page number 6,7).

Refresh: An icon of a circular arrow pointing clockwise.

Thinking Skills: An icon of a cube divided into six faces with the words 'Seductive Thinking', 'Logical Reasoning', and 'Brainstorming'.

Learning Outcome: Text stating: 'At the end of this lesson, you will be able to: Recall topics learnt in Computer Masti so far such as thinking skills, office and Internet tools and healthy practices.'

- The objective of this lesson is to revise thinking skills that students have learnt so far in Computer Masti. At the same time, it strengthens the connection of thinking skills with application skills. For each of the activity, included in the lesson, students have to first identify what thinking skill needs to be applied and second, connect to specific application skills.
- Note that the purpose is for them to revise all the topics they have learnt so far in past years while learning with Computer Masti. In case they want to revise certain topics, make Computer Masti books of various levels available to them.
- The context of the lesson puts Class 8 students in a responsible situation, wherein they are teaching computers to students of lower grades with the use of strategic games. You can present this scenario to students and allow them to come up with ideas for designing these games. You can take activities from the lesson as examples of such games.
- Encourage students to independently do each of the activities included in the lesson. If required, you can guide them on material to be used and questions that need to be framed. Try to let the students apply their own creativity.
- If possible, provide Internet access to students for them to draw inspirations on how to do certain activities or innovatively complete each activity.
- You may want students to design a new game (not included in the lesson) that can be used in the substitute class.



Further Reading:

<http://www.toolsforeducators.com/dice/>

<http://www.thinkingdice.com/>

<http://ausweb.scu.edu.au/aw01/papers/refereed/turner/paper.html>

DO'S & DON'TS with the computer



Breaks and exercises

Take regular breaks while using a computer.

Do exercises to keep fit.



Correct Posture

Keep your chair at proper height.

Maintain proper distance from the monitor.



Share Equally

Take turns for using the Keyboard and Mouse.

Give space to your classmates while using computers.



Keep Clean

Keep the computer and its nearby area clean.



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Do not use the computer for more than an hour per day.



Do not disturb others by playing loud music.



Do not eat or drink near the computer.



Asana

Breathing

(For improving attention)

Pranayam



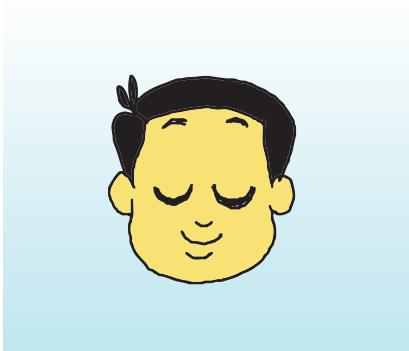
Yoga for eyes

(For relief from RSI - Repetitive Strain Injury)

Palming



Blinking



Rotational viewing



Other asanas which you can do are: Be a cat, Pencil exercise, and Bouncing the ball

Balancing asanas

(For developing concentration and balancing body)

Eka Pada

Pranamasana

One legged prayer pose



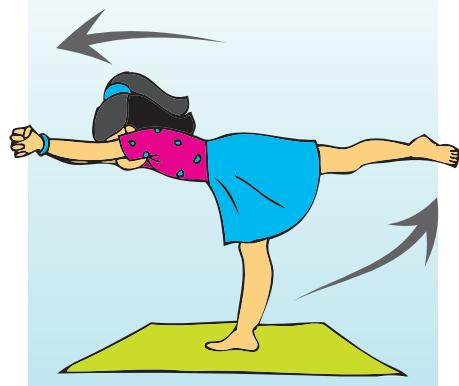
Natarajasana

Lord Shiva's dance form / Dancing pose



Eka padasana

One foot pose



Other asanas which you can do are: Natavarasana (Lord Krishna's pose / Flute playing pose)

anas
you

Yoga for Neck

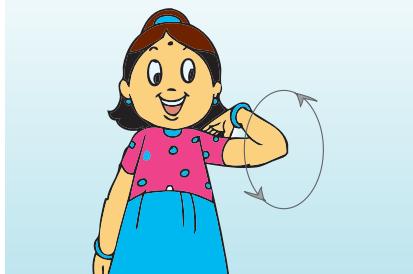
Greeva Sanchalana Neck movements



Yoga for shoulders and back

Skandachakra

Shoulder socket rotation

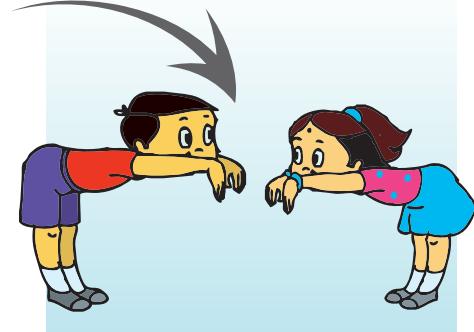


Akarna

Dhanurasana

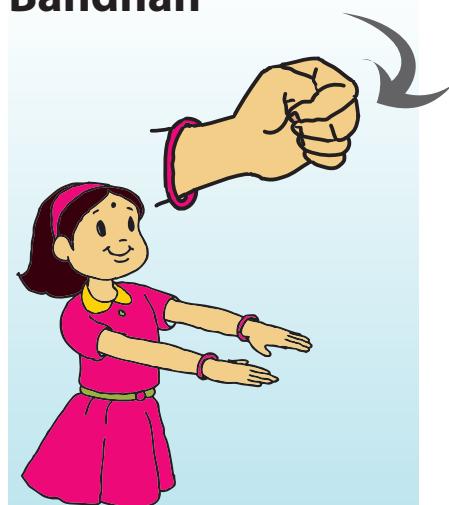


Samakonasana

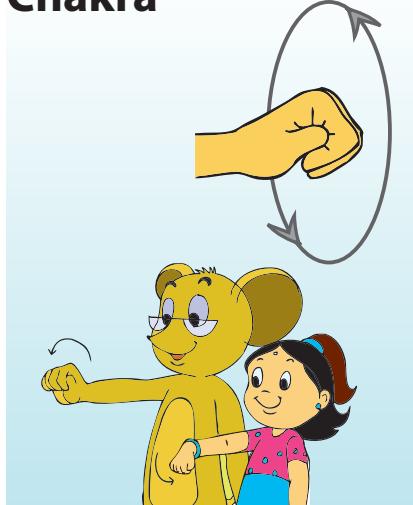


Yoga for hands and wrist

Mushtika Bandhan



Manibandhana Chakra



A fun way to learn computers

Computer Masti

www.computermasti.com



Inside Internet

Aim: In this lesson, you will learn:

- Network components and connectivity.
- Internet connectivity mechanism.
- Basic concept of Client – Server – Applications.
- Network, Data and Internet security.



Tejas: We had only one computer lab in our school till now. This year we will have 2 more such labs. All of them will be interconnected. We can also access internet from any of the computers, in any lab.

Jyoti: The computers in our school office and library will be also on this network. We can share printers. If one printer has a problem we can print using the printer in another lab.  Computer Network

 Advantages of a computer network.

LAN

Tejas: We would like to understand the connections and hardware used to create the network in the lab, office and library.

Moz: How are the computers and devices connected in your lab?

Jyoti: Computers are connected using network cables (see Fig.1). One side of the cable is connected to a network port on the computer and the other side to a box with several ports (see Fig. 2).  Motherboard

Moz: The box is called a network **switch** or hub. A switch is used to interconnect computers in a small area and create a network (see Fig.3). Such a network is called **LAN** (local area network).



Fig.1 Network cable



Fig.2 Network Ports

Concept

LAN (Local Area Network)

- A Local Area Network interconnects computers in a limited area such as a home, school, computer laboratory, or office building.
- Cables (wires) or low-power radio (wireless) are used for the connections in a LAN.

Recall

- A computer network is two or more computers, or other electronic devices, connected together so that they can exchange data.
- A computer network allows computers to share files, and applications. Users can communicate with each other and share devices.
- Any computer that needs to be connected to the network has a NIC (network interface card) which is usually built into the motherboard.

Tejas: Suppose, I want to access a file on Jyoti's computer. What happens when I perform the action? Does the switch relay the data between our computers through the LAN?

Moz: Yes. Suppose some data has to be sent from your computer (A) to Jyoti's computer (B). Sender (A) usually splits the data into small chunks, called **packets**. Each packet also has some extra information, called a **header**. The addresses of sender (A) and receiver (B) are put in the header. Then A sends the packets to the switch. The switch has in-built software that reads the header of each packet, determines the port at which the receiver is connected and forwards the packet on the corresponding cable (see Fig.4). Such a type of communication in which small units of data (or packets) are routed through a network, based on the destination address contained within each packet, is called **packet-switching**.

Jyoti: The packet is similar to a letter enclosed in an envelope. The envelope has the sender and receiver's addresses.

Tejas: Why is the message divided into so many chunks of packets? Why is it not sent as a single packet?

Moz: Breaking the message down into packets allows the same cables (physical path) to be shared among many users in the network. As a result, the capacity of the network to accommodate simultaneous users is increased.

Jyoti: Do the packets have some numbering? At the destination computer, after all the packets are received, they have to get compiled into the full message.

Moz: Yes. The packets are numbered. These are called Sequence Numbers. The packet also has information of total length of the message.

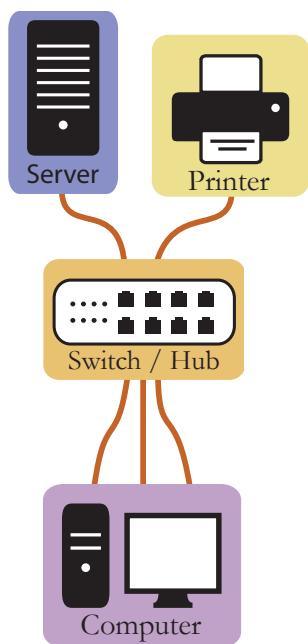


Fig.3 LAN

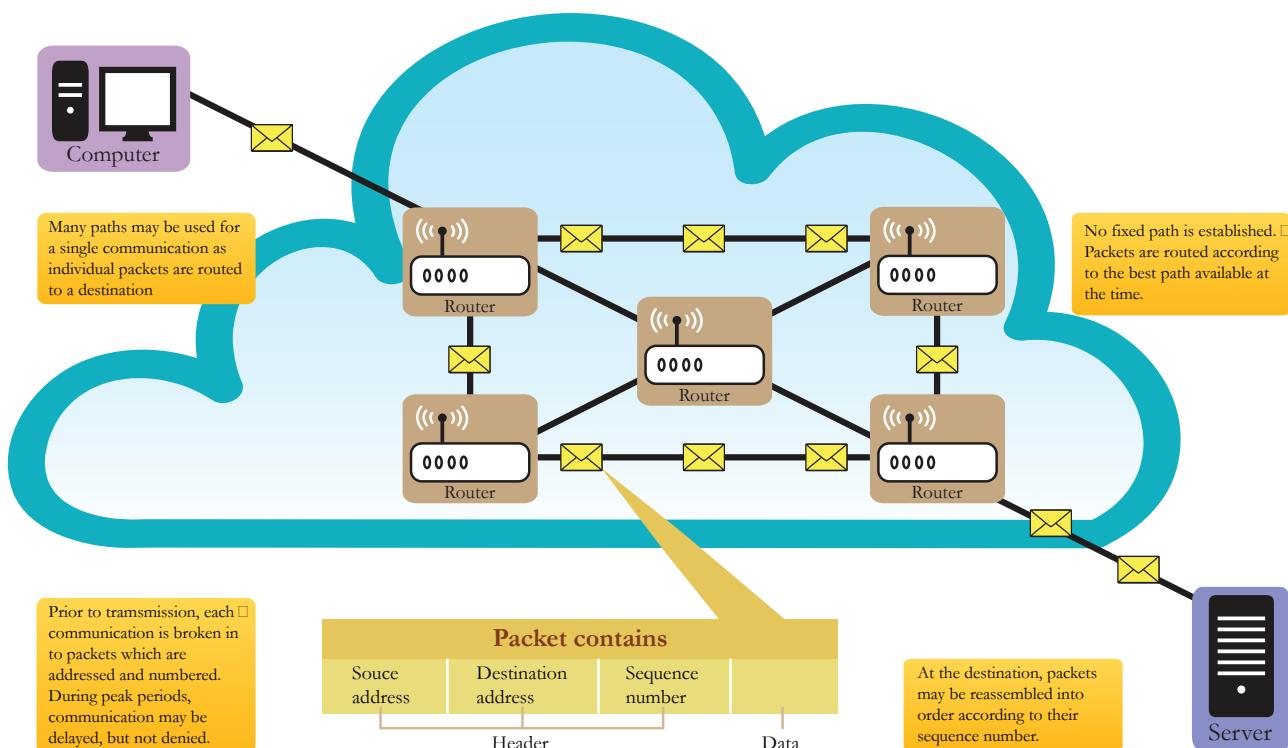


Fig.4 Packet Switching in a Data Network

Packet

Packet: A packet is a formatted unit of data. A packet consists of two kinds of data: control information (header) and user data (also known as payload). The header provides the information the network needs to deliver the user data. For example: source and destination addresses, error detection codes like checksums, and sequencing information. Typically, control information is found in packet headers and trailers, with payload data in between.

Packet switching: A message from one computer on the Internet to another gets divided into packets before being sent. Each packet is then transmitted individually and can even follow different routes to the destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message. Such a type of communication in which small units of data (or packets) are routed through a network, based on the destination address contained within each packet, is called packet-switching.

WLAN (Wireless LAN)

Jyoti: I have seen laptops connecting to the network without a cable.

Tejas: In some places like airports and some offices, cables are not required at all. Anyone with a laptop or a tablet can access Internet.

Moz: These are called wireless connections. Radio signals are used to connect a computer to the network. A wireless antenna to send and receive data is built into the laptops. Similarly, the switch also has an antenna for transmitting and receiving data wirelessly such a LAN is called WLAN (Wireless Local Area Network). (See Fig.5)

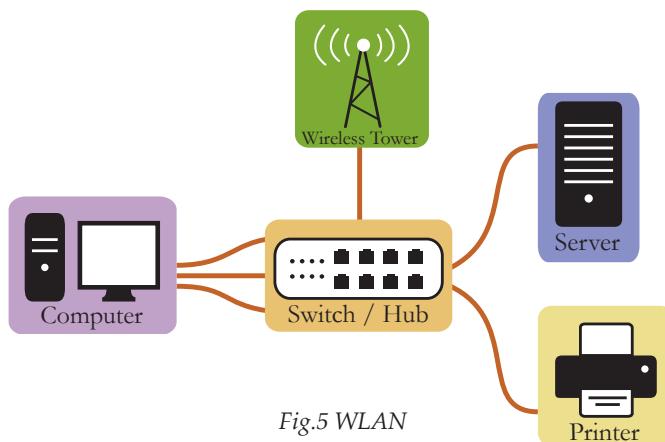


Fig.5 WLAN

WLAN (Wireless LAN)

- A LAN that uses radio signals to connect computers is called **WLAN** (wireless local area network). One commonly used type of radio signals is called WiFi.
- A **wireless switch** with one or two antennas usually sticking out the back of the switch, is used for **sending and receiving data** to and from the computers in WLAN.
- The range of wireless connection is around 50 meters.
- Computers and other devices capable of sending and receiving data wirelessly can become part of a WLAN, when they are within range.

Tejas: We know that we can access applications like Gmail, Amazon online book store from any country. How does a computer in one country connect to a computer in another country?

Moz: Computers across long distances are usually connected with optical fibre cables, satellite radio links, or microwave radio links. Such a network is called WAN (wide area network). Internet is an example of WAN. Two or more LANs can also be a part of a WAN. (See Fig.6)

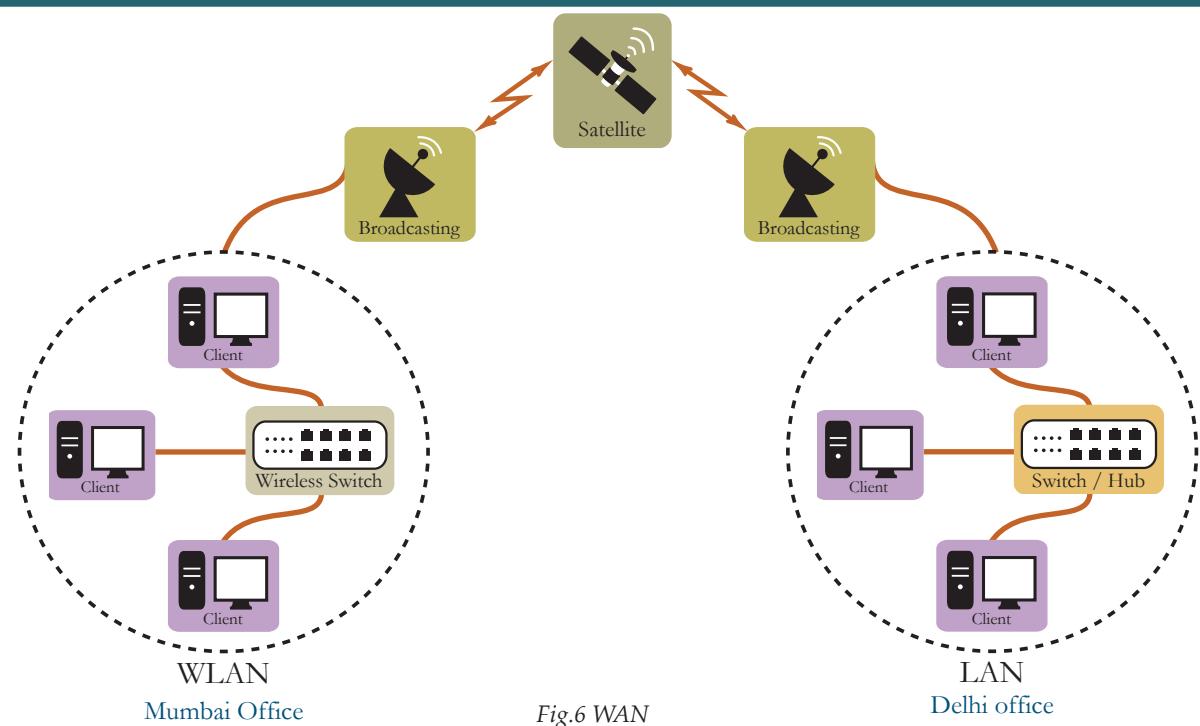


Fig.6 WAN

WAN

Concept

WAN (Wide Area Network)

- A Network which is geographically spread over large areas with links between computers is called a WAN (wide area network).
- The long distance connections are done using technologies such as optical fibre cables, satellite radio links or microwave radio links.

Jyoti: Is there a switch between the LANs or computers communicating across long distances? (See Fig.4)

Moz: Yes. It is a special type of switch that has more functions than a LAN switch. It is called a **router**. It has software to send and receive packets correctly across WANs. Routers communicate with each other to ensure that your packets are delivered to the correct destinations across the WAN/ Internet.

Info

Router

- A router is a network device that connects together two or more networks.
- A common use of a router is to join a home or business network (LAN) to the Internet (WAN).
- The router will typically have the Internet cable plugged into it, as well as a cable, or cables to computers or switch on the LAN.
- Some routers are also wireless capable.

Moz: What are the different methods of connecting to the Internet? You must have used at least one method.

Jyoti: At home we have to connect a dongle (with USB connector) to the computer to connect to the internet (see Fig.7)

Moz: From where do you get this dongle?

Jyoti: We have to buy it from the internet service provider.  ISP

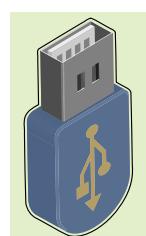


Fig.7 Pendrive

Recall

- An Internet service provider (ISP) is an organization that provides access to the Internet.

Moz: Right. The dongle is a USB device that can be plugged into a computer for internet access. It has an inbuilt wireless that connects to the ISP, similar to mobile phones.

Tejas: On a mobile phone, we can access the internet by enabling some settings.

Jyoti: I have seen some connections that use telephone lines. A device called modem is connected to the computer in such connections.

Moz: Right. Similar to the peripheral devices, a modem converts the data and instructions entered using the device into a pattern of electrical signals. These signals correspond to binary code that can be processed by a digital computer. (see Fig. 8)

① Peripheral devices



Fig.8 Modem

Internet access – Single user and multiuser

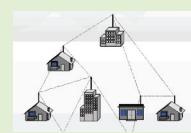
Single user internet connection

- **DSL (digital subscriber line) Modem:** is a device used to connect a computer or router to the internet through a telephone circuit.
- **Broadband Modem:** Uses DSL or a cable Internet service to connect to the internet. Here, the DSL line connects to your phone jack and the USB line or Ethernet to your computer.
- **Mobile broadband:** Uses a wireless internet card, such as a USB dongle, to connect to the internet. This dongle can be used (wherever the ISP provides coverage) by plugging it into the USB port on a net book, PC or laptop.
- **Portable Internet Devices** like smart phones use a variety of wireless technologies such as 3G, WiFi and WiMAX technology to connect to the Internet.



Multi user internet connections

- **WiFi router at home:** Extension of single user by connecting WiFi access switch to Broadband Modem.
- **Fiber-to-the-building Broadband (FTTH)** uses fiber optic cables to connect to the Internet. Such optics-based systems can deliver digital information very efficiently.
- **Wireless mesh networks:** In these, the network connection is spread out among dozens or even hundreds of wireless mesh nodes that “talk” to each other to provide the network connection across a large geographical area.
- **Satellite Connections:** Internet connection through a satellite dish to upload and download data communications is often used for areas that are geographically difficult, such as mountains.



- A Peripheral device is an external object that provides input and output for the computer. Example: keyboard, monitor.

Server farms

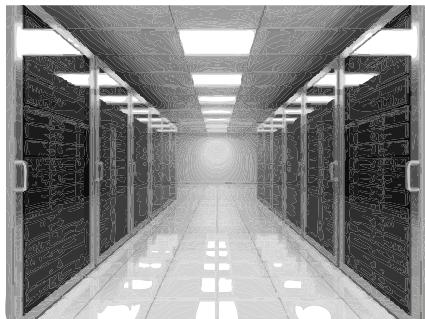


Fig.9 Server Farm



Fig.10 Client (web browser)

Tejas: When we check our email or upload photos to YouTube, Where is the information stored on internet?

Moz: The information is usually stored on a powerful computer called server. Often many servers are interconnected in a LAN depending on the number of users. Such a LAN is called a server farm. (see Fig. 9)

Moz: The computer you use to access Internet applications is called a client computer (see Fig. 10).

When you type in a web address in the web browser, you are providing the address of a Web **server**. The web browser on the client sends a **query** to the web server, asking for the web page (**data**) that you want. The server *processes the request* and *sends the response* the page that you requested (see Fig. 11). This is an example of accessing web pages.

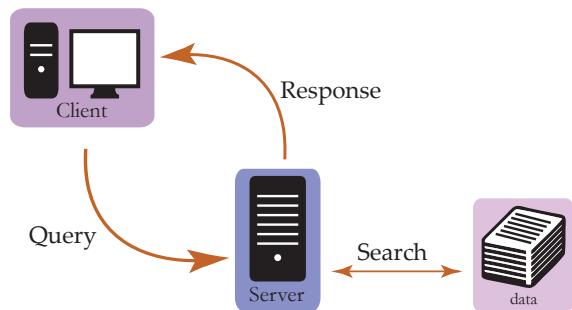


Fig.11 Server-client

Moz: Give a few more examples of what can be stored or accessed from a server.

Jyoti: We can use servers to save and retrieve files. For example, photographs (Picasa), documents (Google docs), and Videos (YouTube).

Tejas: Servers have to work without failure since they provide so many important services, to a large number of people.

Moz: Correct. Servers are built to provide fast and reliable service to large number of client. Hence they are more expensive than client computers.

Client and Server

Computers connected together to create a network fall into two categories: servers and clients.

- **Client**

Computers that people use for their work, like accessing internet and communicating with others. For example: Your home computer, laptops, tablet, and mobile phone.

- **Server**

Powerful computers that provide ‘services’ to the client computers on the network. Servers are built to be reliable. They are much more expensive than clients. For example: Mail servers like Gmail, Information servers like Wikipedia, Online commerce servers like Amazon, flipkart, Online banking servers, Online travel management servers like irctc.

Tejas: What happens if the power goes off for the server?

Moz: The servers are protected from power disruptions by using an UPS (uninterrupted power supply). UPS is an electrical apparatus that provides emergency power to the server. UPS provides power by means of one or more attached batteries and associated electronic circuitry.

Info

UPS

- Servers that are used by large number of people on a continuous basis usually also have an alternate source of power, such as a generator.
- Uninterrupted power supply (UPS) is an electrical equipment used to protect the servers from power disruptions. UPS provides power by means of one or more attached batteries and associated electronic circuitry.

Network Security

Jyoti: What is a firewall? We have heard that a firewall is used to protect computers from being hacked?

Moz: Yes. A firewall secures a network from unauthorized access and communication (see Fig.12). A firewall can be of two types Software Hardware.

Software Firewall: A software firewall is usually installed on desktops and laptops along with the OS.

It monitors the applications that access the Internet and allows only those that are approved by the user. (see Fig. 13)

Hardware Firewall: A hardware firewall router passes data between networks and also contain hardware firewall components. It's actions are similar to the software firewall but it has many more options. (see Fig. 14)

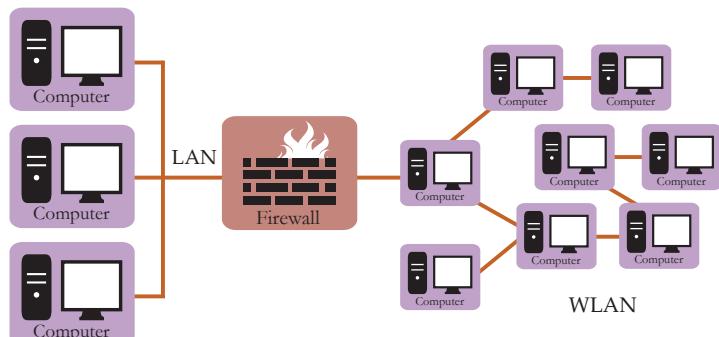


Fig.12 Firewall

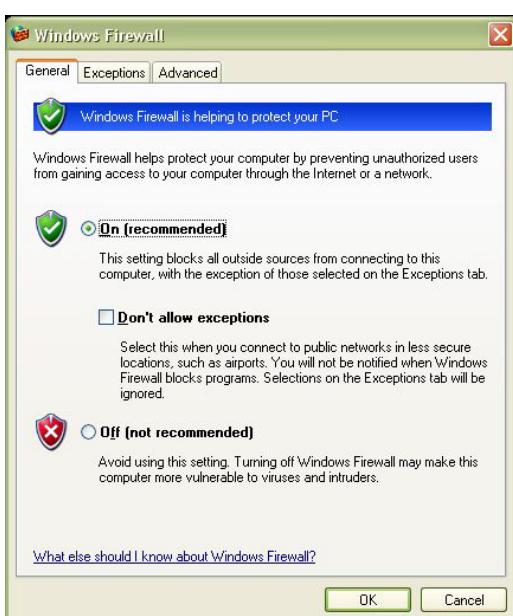


Fig.13 Windows - Software Firewall

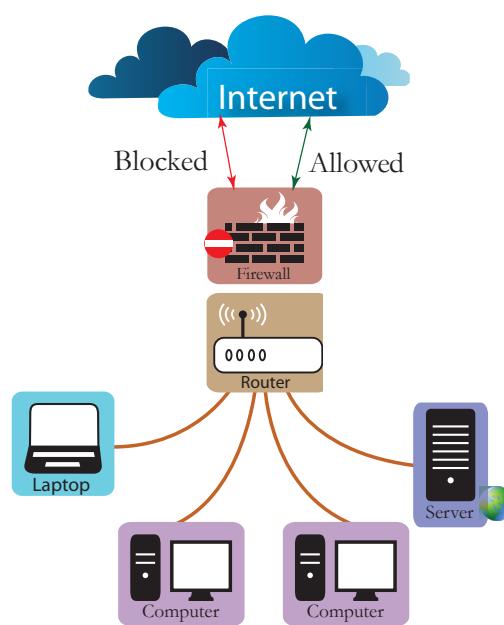


Fig.14 Hardware Firewall - Router

Jyoti: A firewall is similar to the Security guard of a building who checks incoming people to ensure that they are legitimate visitors and checks outgoing people to ensure that they are not stealing anything.

Moz: You are right.

Concept

Firewall

A firewall blocks unauthorised connections being made to a computer or LAN. Normal data is allowed through the firewall (e.g. e-mails or web pages) but other data is blocked, unless specifically allowed by the user.

To protect an individual computer, a software firewall is built into the OS of the computer. Several setting can be made in the firewall software to protect the computers from unauthorized access and communication.

To **protect** whole LAN from people (who accesses a computer system by circumventing its security system) on the Internet, a hardware firewall device (similar to a router) is placed *between the LAN and the Internet connection*.

Data Security

Jyoti: When we register with a website, we have to give some personal information, like email address, phone number and we have to also enter password. How is this information kept secret?

Moz: Good point. Let us take an example. I want to pass on a message "Leaving for Delhi today", to you. Now let us modify this using some code, so that others cannot understand.

Jyoti: What is the code?

Moz: You can build your own code. For example, we can decide that every letter in the message will be replaced by the fourth letter after its position in the alphabet.

Tejas: That means instead of 'A' we write 'D'. Instead of 'L' we write 'O'. This is fun.

Moz: This process of building a secret code by transforming information using an algorithm is called **encryption**. The code is called Cipher.

Jyoti: Let us encrypt the given line. Let us first write down this code (cipher)!

Examples

Plain: ABCDEFGHIJKLMNOPQRSTUVWXYZ

Key: Replace each letter by 4th after.

Cipher: DEFGHIJKLMNOPQRSTUVWXYZABC

Plain text: Leaving for Delhi today.

Ciphertext: OHDYLPJ IRU GHOKL WRGDB

Moz: Good. Note that the encrypted text is also called ciphertext. By the way, this code is called ceaser cipher as Julius Ceaser was the first one to use such a cipher to pass on messages.

Tejas: Now we too can use code language among a group of friends, so that others do not understand what we are saying.

Jyoti: All the friends need to know the cipher code to understand the messages. We have to now reverse the replacement of code. Let us see our example.

Examples

Cipher: DEFGHIJKLMNOPQRSTUVWXYZABC

Key: Replace each letter by 4th previous.

Plain: ABCDEFGHIJKLMNOPQRSTUVWXYZ

Ciphertext: OHDYLPJ IRU GHOL WRGDB

Plain text: Leaving for Delhi today.

Tejas: 'O' has to be replaced with 'L', 'H' with 'E' and so on and we get the message "Leaving for Delhi today"

Moz: Right. Several algorithms are used for the encryption and decryption of information. You can build your own cipher. The process of getting the plaintext from the ciphertext is called **decryption**.

Concept

Data Security

- **Encryption:** is the process of converting of data (plain text) into a form, that cannot be easily understood by unauthorized people.
- **Decryption:** is the process of converting encrypted data (ciphertext) back into its original form, so it can be understood.
- **Cipher:** is the code or the algorithm used in the encryption and decryption of data.
- **Key:** is the secret of the cipher, known only to the authorized people.

Moz: Now, let us look at examples of information which needs to be kept secret.

Jyoti: When we buy for example railway tickets on-line, credit-card information has to be given. In some places passport numbers are taken as identification information.

Tejas: Many sites ask for personal details for payments. For online banking, bank account information has to be given to access account information. All such information has to be kept secret between the client and server

Moz: Right. Did you observe *https* in the URL, for some of the sites which ask you for this information?

Jyoti: Yes. It says "https://" instead of "http://". When we want to book train ticket online the URL used is: <https://www.irctc.co.in/> What does https mean?

Moz: "https://" means that the information that you provide is encrypted. Since for ticketing, sensitive information like your email id and your date of birth need to be provided, the website is configured to use data security for transfer of information over the network (your computer to server). This is indicated by *https*.

Concept

Website security

(HTTPS) provides encrypted communication between a client and trusted web server. HTTPS connections are often used for payment transactions on the internet, and where sensitive information is needed on some information systems.

Moz: Now that you are familiar with all the aspects of network, security setup and the hardware related to networks, go ahead and design a network for the school having three computer labs (each lab has 5 computers), and a library (which has 2 computers) and an office (which has 3 computers). Labs, office and library are all located in the same building but in different floors. (Sample solution with one lab is given in Fig. 15).

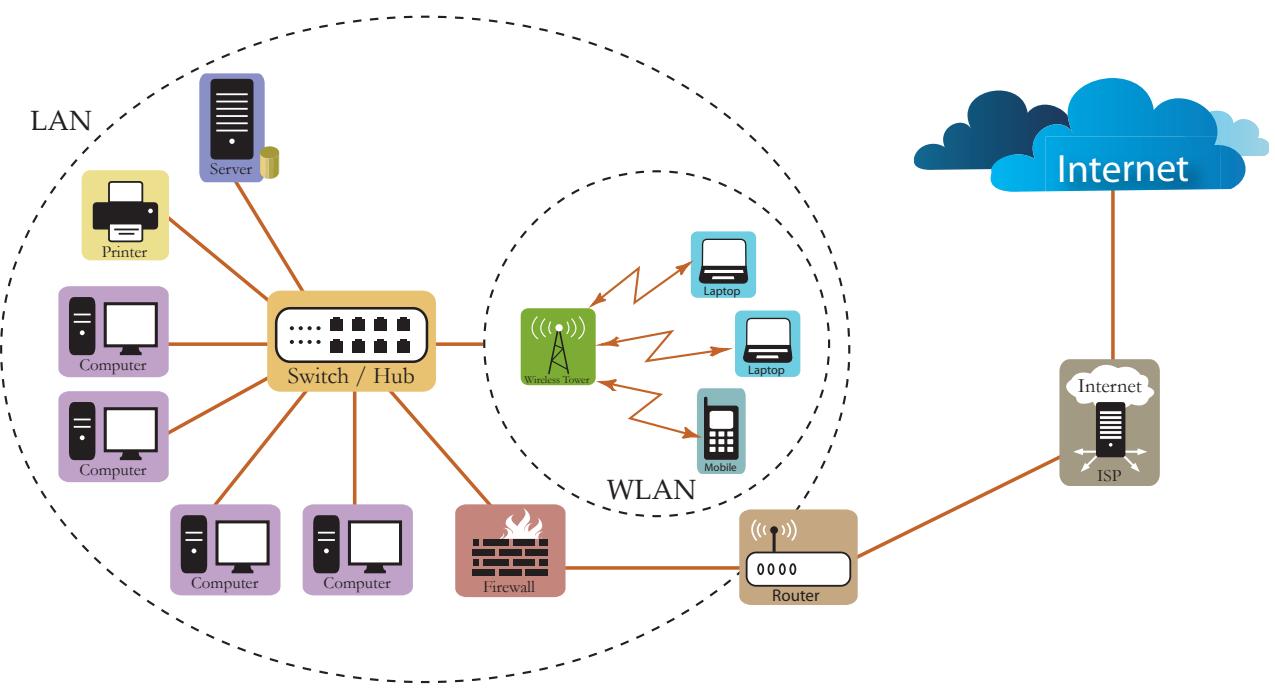


Fig.15 LAB 1

Network

This diagram shows a network structure with a central node connected to various clients (Client, Server, Internet) and other network nodes. Labels include "Tomas H1", "Tomas H2", "Tomas H3", "Tomas H4", "Tomas H5", "Tomas D1", "Tomas D2", "Tomas D3", "Tomas D4", and "Tomas D5".

Secure

This diagram illustrates a secure communication process between a Client and a Server. It shows a "Hello Alice" message being exchanged, along with a "public key" and a "private key". A password "x0ak3 d\$2Rj" is also shown.

Learning Outcome

At the end of this lesson, you will be able to:

- Explain what is LAN, WLAN, WAN, packet and packet-switching.
- State the function of a Switch.
- State what is a router and its function.
- List different ways of connecting single user and multi-user to the Internet.
- To recognize and use features of data security.

WORKSHEETS


1. Match the following:

- | | |
|------------|--|
| i. LAN | a. Internet browser |
| ii. WAN | b. Wireless LAN |
| iii. WLAN | c. Local Area Network |
| iv. Server | d. Wide Area Network |
| v. Client | e. A powerful computer that provides a service, such as centralised file storage |

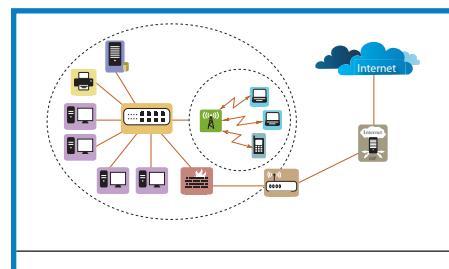
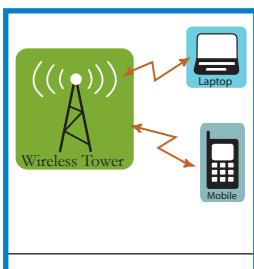
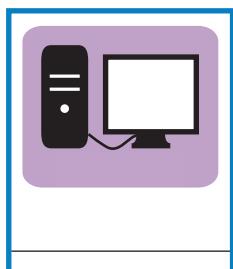
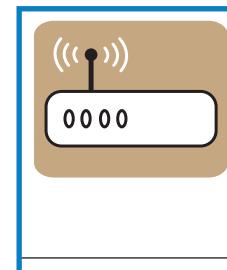
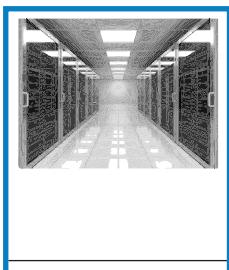
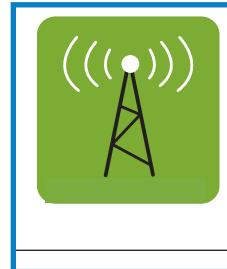
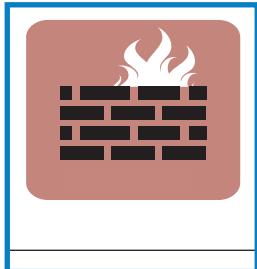
2. Fill in the blanks

(Choose from: WAN, Switch, Printer, Server, Files, Firewall, Radio Signals, Router, LAN, Client, https, Satellite)

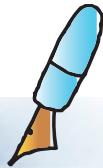
- i. To setup networks: network cables, _____, _____ and _____ are used.
- ii. In a network, resources such as _____ and _____ can be shared.
- iii. A wireless lan (WLAN) uses _____ to connect computers.
- iv. Network setup in a small office is called _____.
- v. The internet is an example of _____.
- vi. A powerful computer that provides a service, such as centralised file storage is called _____.
- vii. A computer that connects to internet to fetch mails is called a _____.
- viii. Websites that transfer information securely use _____, so that the information is encrypted.
- ix. A _____ is used to protect the computer from unauthorised use.

3. Identify and label the following parts of a network:

- | | | | | |
|-----------------|------------|---------------|---------------|-----------------|
| • WAN with LANs | • Firewall | • Server farm | • Satellite | • Network cable |
| • WLAN | • Router | • Client | • Radio waves | |



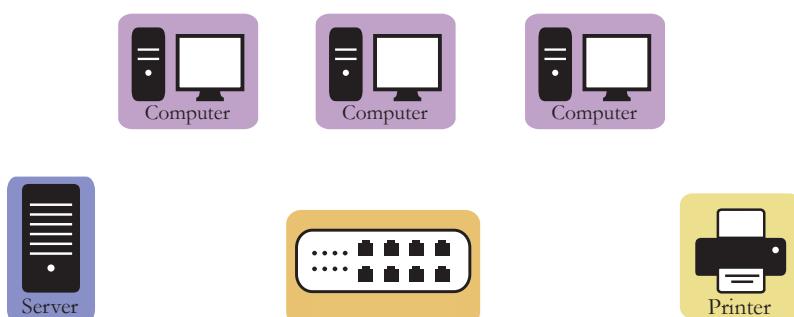
WORKSHEETS



4. Complete the following LAN, WLAN and WAN by:

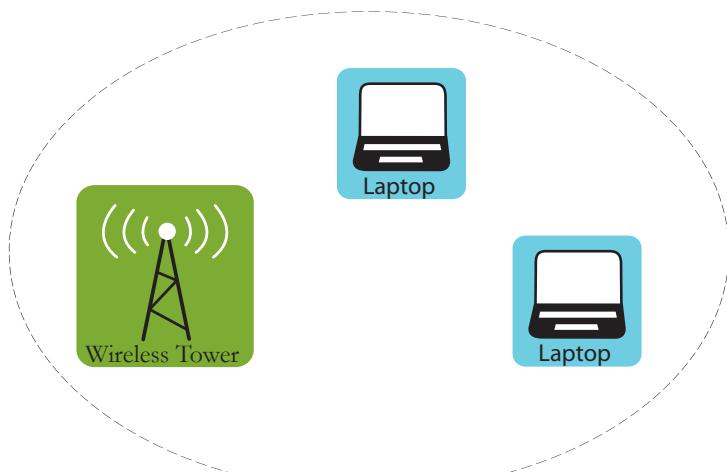
- Drawing the missing hardware, missing connections.
- Labelling the hardware.
- Labeling client and server.
- Making appropriate connections.

a.



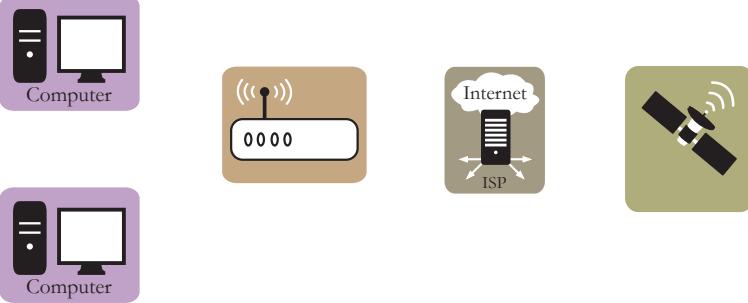
LAN

b.



WLAN

c.

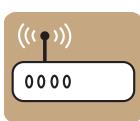
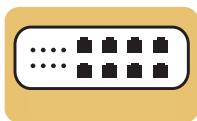


WAN

WORKSHEETS



d.



WAN

5. A cipher with an example is given below. Study these and do the following:

- Encrypt your name using the given cipher.
- Decrypt using the given cipher : 31 43 23 53 34 44 51 24

Cipher:

| | | | | |
|---|---|---|---|-----|
| 1 | 2 | 3 | 4 | 5 |
| 1 | A | B | C | D |
| 2 | F | G | H | I/J |
| 3 | L | M | N | O |
| 4 | Q | R | S | T |
| 5 | V | W | X | Y |
| | | | | Z |

a. _____

b. _____

c. _____

Example

Plaintext: HELLO

Ciphertext: 32 51 13 13 43

6. Build a cipher of your own.

- Encrypt your name using the cipher. Show this to your friends.
- Write a message using your cipher. Ask your friends to decrypt the message.

a. NAME: _____

CIPHER: _____

b. MESSAGE: _____

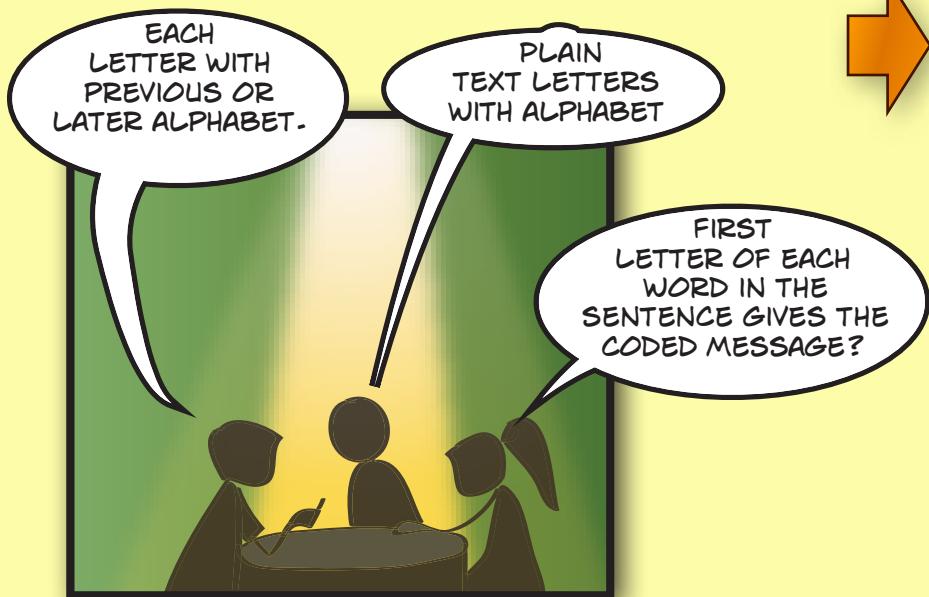
CIPHERTEXT: _____



The 3 Investigators

SAM, PREETI, ALI, "THE THREE INVESTIGATORS" AS THEY WERE KNOWN SOLVED MANY PROBLEMS.

THE 3 INVESTIGATORS COME UP WITH THEIR CODE SYSTEM



SUBSTITUTE EACH LETTER OF THE MESSAGE WITH THE NEXT LETTER OF THE ALPHABET AND THEN CREATE A SENTENCE.

EXAMPLES USING THE CODE:

ENCRYPTION

- PLAIN TEXT: SOS
- CODED SENTENCE: (TPT) TRY PAYMENT TOMORROW.

DECRIPTION

- CODED SENTENCE: (QBSUZ) QUOTATIONS BY SAMUEL ULYSSES ZEN.
- PLAIN TEXT: PARTY

ENCRYPT THE FOLLOWING MESSAGE USING THE CODE:

ALL
IS
WELL

DECRYPT THE FOLLOWING CIPHERTEXT USING THE CODE:

The Vault Opened. Tom Found Uranium. Queen Picked Jewels Of Udaipur.

CODED SENTENCE: _____

MESSAGE: _____

WRITE YOUR OWN MESSAGE AND SHOW IT'S CIPHERTEXT:

MESSAGE: _____

CODE: _____

CODED SENTENCE: _____



The 3 investigators

SAM KIDNAPPED AND SENDING THE CODE MESSAGE

IN ONE OF THE CASES SAM WAS KIDNAPPED.

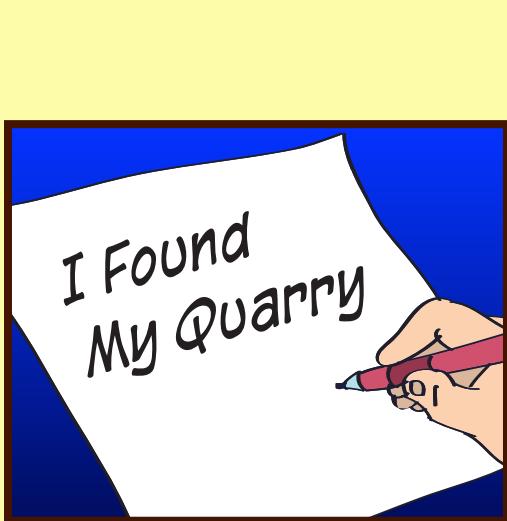


THE KIDNAPPERS WANTED SAM TO WRITE A NOTE TO PREETI AND ALI SAYING THAT THE KEY MUST BE HANDED OVER TO THE MESSENGER.



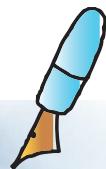
IN THIS CASE THE KIDNAPPERS WANTED THE KEY TO THE TREASURE WHICH WAS WITH THE OTHER TWO INVESTIGATORS.

PREETI DECODING THE MESSAGE



ASSIST PREETI TO DECODE THE MESSAGE...

DECODED MESSAGE:



7. Design a network for Tejas and Jyoti's school. The computers are located in labs, office and library.

Details of computers to be included:

- Three computer labs (5 computers in each lab), office (4 computers) and library (2 computers).
- One server.

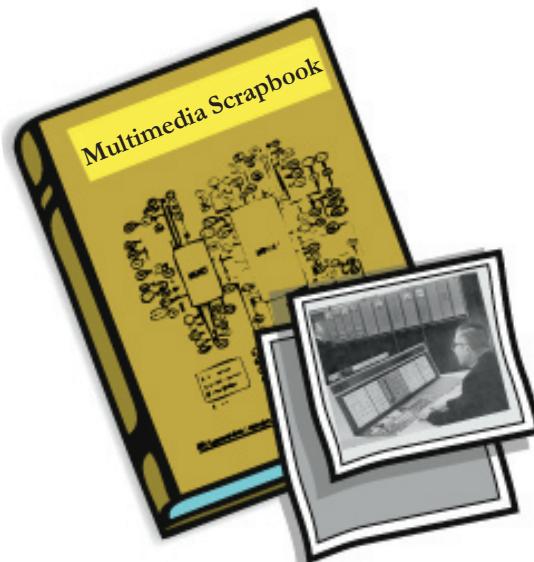
Guidelines for drawing the layout:

- Draw the network layout in each of the three labs, office and library.
- Interconnect the lab, office and library networks.
- Provide a connection to the internet through an ISP so that all the computers in the network have internet access.
- Include a firewall in your design.
- Label the LANs, WAN, WLANs, in your network by putting a dotted line around..
- Label the type of computers (client or server) and the other hardware used in your design.
- Indicate labs, office and library in your design by labelling.



- **History of Internet - A multimedia Scrapbook:** Create a multimedia scrapbook that documents the different phases in which Internet connectivity has evolved.

Note: A Multimedia Scrapbook is an on-line scrapbook, that provides links to a variety of media and content types on a chosen topic. The links and content can be photographs, maps, stories, facts, quotations, sound clips, videos, virtual reality tours, books. Use your thinking skills to gather the information that is important and significant. Use your creativity to design and create the scrapbook on-line. <http://www.kn.pacbell.com/wired/fil/pages/scrapmultimedlo.html>



1. Find out about the history of Internet. Who invented www? When?
2. What are some of the other types of switches and what are they used for?
3. Find out what is Cryptography software. What is RSA?

- The objective of this lesson is to teach students about how Internet connection is set up. The students have been enjoying seamless Internet connectivity without realizing how it works. The lesson brings out the technical details of what it takes to be able to access Internet.
- It is likely that students have already got an opportunity to use LAN in the school. You can draw their attention to the same, to explain how the network is set up. Similarly, they may have accessed wi-fi connectivity and/or have observed routers set up. This could be in selected places within school premises or at home. Else you may show them a video wherein people are accessing Internet without any wires being connected to their respective machines.
- Question them on how they think Internet connection happens. Use this opportunity to explain the different ways of securing Internet connection and how each one works. Refer concept and info boxes included in the lesson to explain this point.
- At regular intervals (as the corresponding portion is taught), ask students to solve the worksheet questions.
- You can ask them to do the activity included in the lesson as an exercise to apply their skills to set up a network. Draw their attention to the efforts of system administrator so that they can enjoy Internet connection without any hassles. In case if the school has a system administrator, get that person to address students and share details about their job and variety of tasks they do.
- Encourage students to find out about history of Internet. They may find it interesting to know about how the entire world began getting interconnected and what were the milestones in it.
- Summarize the lesson by revising important technical points. You can work out the worksheets together with the students in the class.

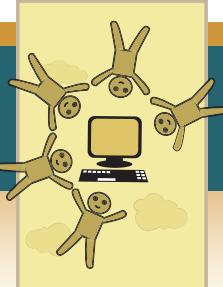


Further Reading:

<http://computer.howstuffworks.com/internet-technology-channel.htm>
<http://www.igcseict.info/theory/4/index.html>

Notes:

3



Social Networking

Aim: In this lesson, you will learn:

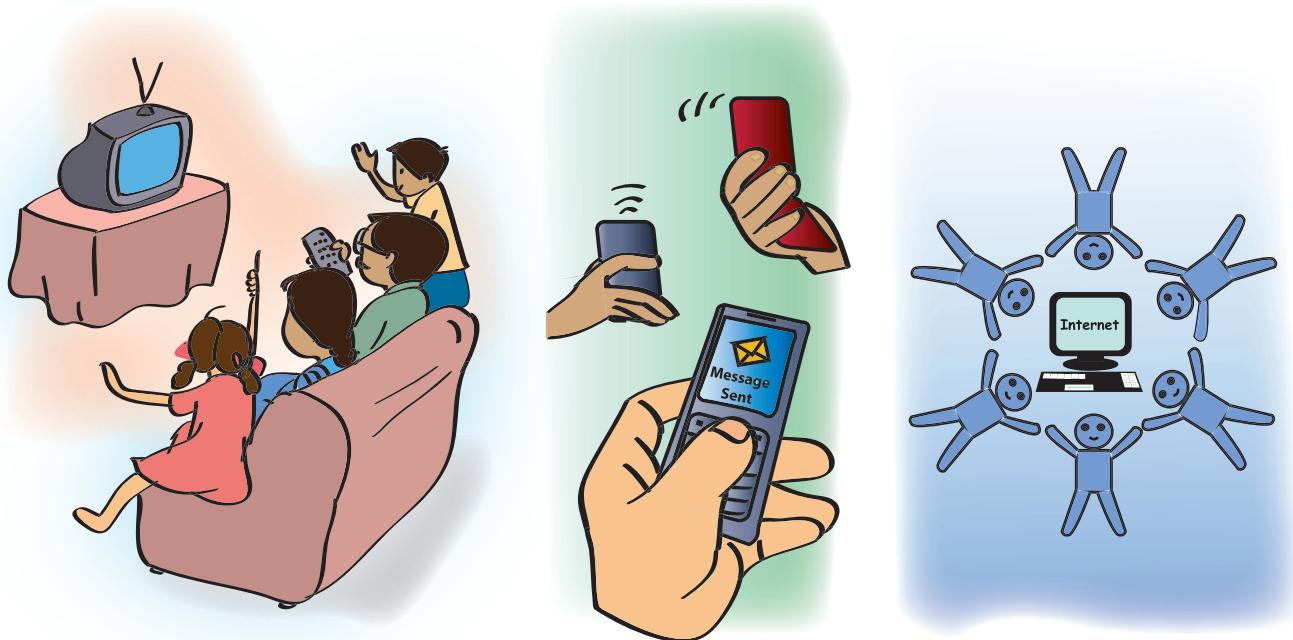
- Social networking websites: purpose and features.
- Pros and cons of Social networking websites.

Jyoti: Moz, we have been given a new exciting assignment in school and we want to discuss some points with you.

Tejas: Yes, Jyoti is writing a report on “Features of some popular Social Networking sites” and I am writing on “Pros and cons of Social Networking”.

Jyoti: I found that Social Networking is a term that has many definitions. A simple definition is: “Social Networking Sites (SNS) are web sites that allow individual users to not only to create and share content, but also to communicate with other users on the site.”

Tejas: This kind of networking and communication activity was happening earlier too, even without computers. Information was disseminated through various media like Radio, Newspapers and Television. Communication was mostly through letters and telephone.



Jyoti: Even after the advent of computers and Internet, the earlier websites were passive, that is, the user was only at the information receiving end. He/she could not react to the given information or contribute content to the website.

Moz: The next development was social networking sites, where the user became an active contributor to websites. Two examples of this model are online newspapers, where you can comment on any article, and online Wikipedia, where all the content is created and corrected by users themselves. Can you give me some more examples of social networking sites (SNS) that you have heard about or used?

Tejas: I use Picasa for sharing my photos and YouTube for sharing my videos. I also enjoy the activity of viewing and commenting on my friend's photos and videos on these sites.

Jyoti: I use Facebook to keep in touch with my friends and Flickr to share photos. I have seen my parents using LinkedIn to network with other professionals (See Fig 1).

Moz: Looks like you are already adept at using SNS for various activities. Why do you think SNS have become so popular?

Jyoti: SNS lets you stay connected to friends and family. You can also find old friends with whom you may have lost touch. SNS are popular because they are very easy to use. The user need not be aware of any programming languages or specific tools in order to use them.

Moz: All the SNS provide some basic features like profile creation, content uploading, and content sharing.

Some Social Networking Sites

The collage displays the evolution of social networking sites over a decade:

- Wikipedia (2001):** Shows the homepage with a globe composed of puzzle pieces and a sidebar with links like "Main page", "Current events", and "Recent changes".
- Google+ (2011):** Shows the main landing page with the title "Google+", a "Sign in" button, and icons for "Circles", "Games", "Stream", "Hangouts", "Photos", and "Events".
- LinkedIn (2003):** Shows a company profile for "Computer Masti" with tabs for "Overview", "Careers", and "Products".
- Facebook (2006):** Shows the sign-up page with fields for "First Name", "Last Name", "Email", "Re-enter Email", "New Password", and "Birthdate". It includes a "Things that connect us" section with a video player.
- YouTube (2005):** Shows the "EDU" channel with video thumbnails for "How Do Hurricanes Get Their Names?", "ALEXANDER THE GREAT", and "Teenage life in ancient Rome".
- Picasa (2004):** Shows the homepage with the tagline "Create, edit, and share your photos" and sections for "Circles" and "Photo Stream".

Fig. 1

Tejas: Other specific features depend on the core focus area of the SNS. For example, Flickr has photo sharing as the main focus, YouTube has audio and video file sharing as the main focus, whereas Wikipedia has content creation as its main focus. These lines of distinction between SNS are also blurring because the new versions of all SNS are trying to merge focus areas, so that the user need not visit different SNS for different activities. For example: Facebook provides search, photo upload, video upload, chat room, instant messaging and email. (See Info box)

Users privileges

| Category Name and Examples | Description |
|---|--|
| BLOG Eblogger, Wordpress   | Blog websites allow users to enter posts about any topic. These posts can in turn be read and commented on by other users. Blogs are used by people to publish their creative content on the Internet. The posts can be organized based on topic and date. |
| REFERENCE WEBSITES Wikipedia  | Reference websites are online encyclopedia, where users or subject matter experts create content on any topic. The content is then published after review. |
| VIDEO SHARING YouTube  | Video sharing sites allow users to upload video files. Other users can watch, share and comment on these files. |
| PHOTO SHARING Flickr, Picasa, Slideshare    | Photo sharing sites allow the users to upload photos, organize and create digital albums. Other users can view, share and comment on these photos. |
| E-COMMERCE IRCTC, Ebay, Amazon, Flipkart     | E-commerce sites allow users to buy products like electronic goods, automobiles, books, household goods, clothes and tickets. The users can pay online for the product, in many ways such as credit card or cash on delivery. |
| NETWORKING WITH FRIENDS Facebook, Orkut, Myspace, Ibibio, Hi5      | Friends sites allow users to create profiles, belong to groups, list friends. A user can create content and keeps in touch with family and friends. |
| FORUMS cnet, quora, techspot    | Forums have different topics under which users can post queries or discuss on some specific topic. Technical forums are very popular where users can get their doubts clarified by experts. |

Jyoti: As a summary, I have created mind maps of SNS features as shown below.

Social Networking Sites (SNS) Basic Features

Register/Create profile: Each user fills in information in a given form with data on age, education, location, likes, dislikes and hobbies. The user can add friends, categorize them into groups, decide how his/her profile is viewed and by whom it is viewed.

Security settings: The user can configure settings where she decides which content on her page is public or private. The user can block content from being viewed by a list of users, can report SPAM and flag content.

Networking features: Activities that the user can perform:

- Chat with other users.
- Instant messaging with other online users.
- Upload photos, videos so that they can be viewed by others.
- Play games.
- Enter comments on content generated by other users.
- Send email.

Search and support: The user can search for content based on keywords, interests, schools. The user also has support in the form of FAQs and forums.

File/Photo/Video sharing SNS

- Out of the many different kinds of SNS, File/Photo/Video sharing sites are very popular. Some important aspects of these sites as shown in the figure are:
- These sites need a registration, but they can also be accessed using the already existing login passwords on other sites like Google, yahoo. Example: YouTube allows the user to access its site with Google account name and password.
- Some of the services provided by the site are free and some are paid. Example: Minimal storage space is given for a free account but unlimited storage is provided for a paid user.
- All users can Create, edit, upload, search and organize their files (documents, audio, video, photos) on these sites.
- Some sites (example: Photo Bucket) have special software tools to edit photos, add effects to videos, create innovative photo albums, and import photos from other SNS.
- Privacy settings on the users account enable the user to share the content accordingly (public, private, can be viewed only by friends etc.)
- Most of these sites can be accessed even from mobile devices.

Other features of Social Networking Sites (SNS)

- Crowdsourcing: Outsourcing of tasks on the SNS which can be performed by individuals across the globe example: <http://www.99designs.com> is a website where clients can post requirements for a design assignment (logo, website, business cards etc) and individuals can submit their designs. The client gets to choose the best design and pays the individual accordingly.
- Mashups: Combining visualization and data to create new services. Example: A mashup of Google maps and twitter allows the user to see the areas on the google map from where the popular twitter content is being posted. Newsgroups, forums and social bookmarking sites are different ways in which individuals with common interests can interact with each other.
- Foursquare, WAYN (Where are you now) are examples of SNS where the user posts his/her current location details and in this way users know the whereabouts of their friends.

Info

Info

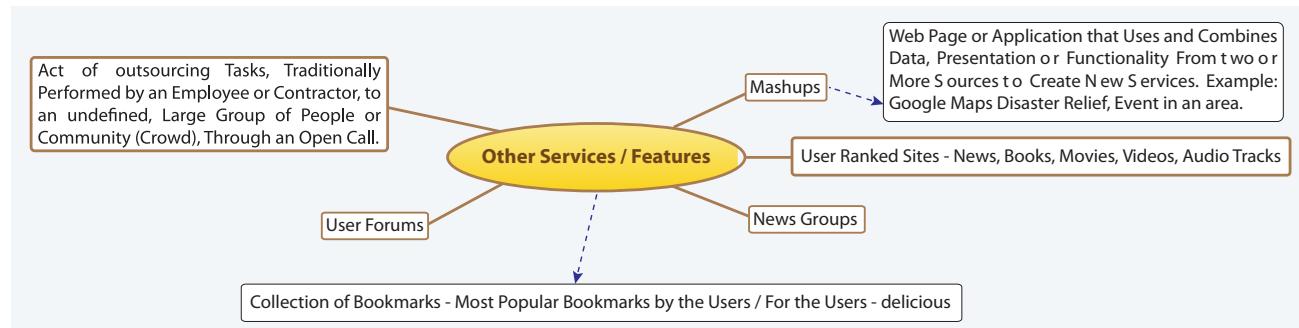
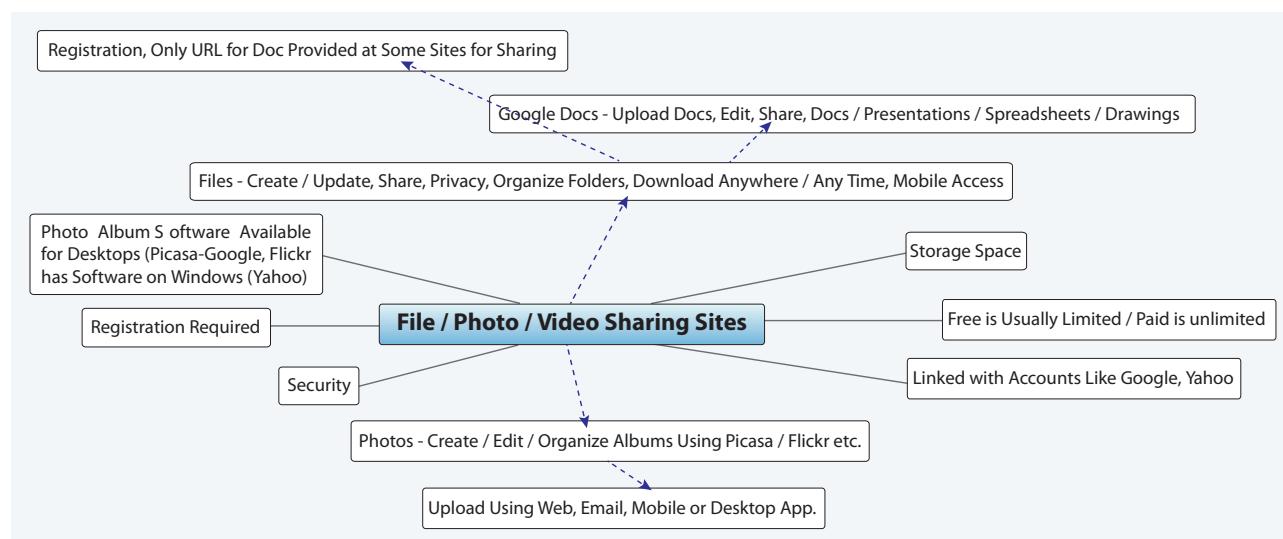
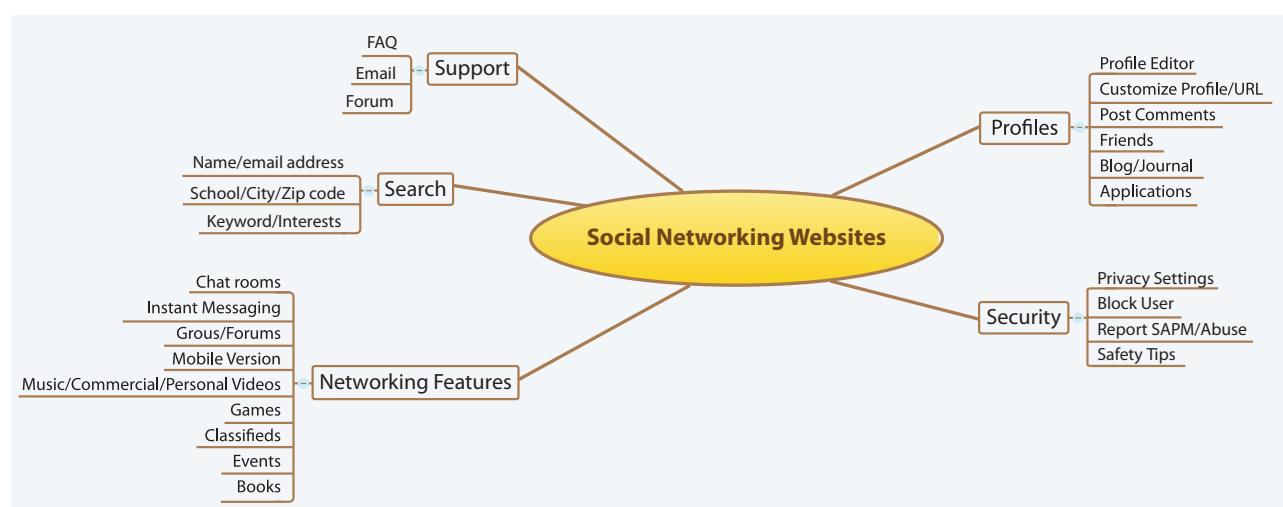
Info

Moz: Can you think of any other purposes where SNS are used?

Tejas: People from all walks of life including teachers, businessmen, doctors and government officials use these tools for various purposes.

Jyoti: Our school teachers use SNS to keep in touch with current and graduated students and also for clearing our doubts. Companies use SNS to create WebPages for their products, gather feedback from consumers. Doctors use SNS to keep their patients informed and government officials are using SNS to reach out and listen to the citizens.

Moz: Another critical area in which SNS are immensely helpful is disaster management. Live data collection and dissemination through these sites is preventing loss of lives, property and also helping in fund collection during natural disasters. Example: Ushahadi (www.ushahadi.com) is an open source project which broadcasts crisis information through SNS like twitter, Facebook etc.



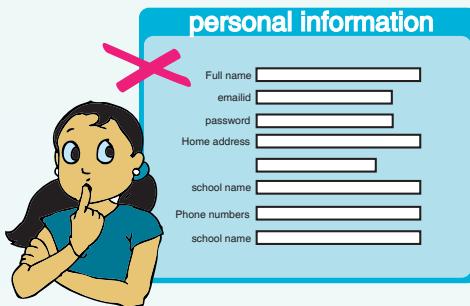
Tejas: Let me also briefly touch upon the pros and cons of SNS. I have created a T-chart as below.
(See <http://www.worksheetworks.com/misce.../graphic-organizers/tchart.html>)

| Social Networking Sites (SNS) | |
|---|---|
| Pros | Cons |
| <p>Instant communication: Today we can disseminate information in real time because of SNS. [When communication is through letters, the time for information to reach from one place to another depends on the geographical location of these places.] Today with SNS, email and chat tools, communication channels available for individuals have increased. Information flow is also quick, that is, as and when an event is happening anywhere in the world, people elsewhere can be aware about it.</p> <p>Collaboration: SNS allow users to collaborate and participate in team activities very easily.</p> <p>Networking with people: SNS allow users to network with friends and family easily, irrespective of their geographical location.</p> <p>Making new friends: SNS allow users to make new friends and help professionals to make new contacts.</p> <p>Creative expression: Users with a flair for writing can now express their creative ideas and generate content on blogging websites.</p> <p>Educational discussion platform: SNS can be a powerful tool for online education. Teachers and students can use SNS to connect to each other and discuss educational topics.</p> <p>Access to information: SNS allow users create and publish information on a variety of topics which is now easily accessible to one and all.</p> <p>Online marketing for business: Companies are increasingly using SNS not only for building awareness of their products, but also to hire personnel, to announce new launches and to promote their products and services. SNS have become a new channel for sales and marketing and also to get consumer feedback.</p> | <p>Addictive: With access to information at the click of a button, people are increasingly spending more and more time on SNS. Spending time on activities like writing comments, and playing games is not always productive.</p> <p>Lack of face to face (f2f) social skills: With so much of time being spent in front of a computer for activities ranging from reading a book, sending mail, chatting, uploading media, and playing games, there is very little time left for developing social skills through face to face (f2f) interactions.</p> <p>Security: With users forging their identity and misrepresenting themselves, cases of bullying, abuse and duping of individuals may take place.</p> <p>Lack of monitoring content: As SNS content is not strictly monitored; it might prove harmful if young adults have access to inappropriate content.</p> |

Moz: Appropriate guidelines have to be followed while accessing SNS and such sites have to be used with discretion to actually leverage their advantages. Let us look at Social Networking Safety Rules.

Social Networking Safety Rules

SMART PLUS
are rules associated with
Social Networking usage.



S

Keep Safe

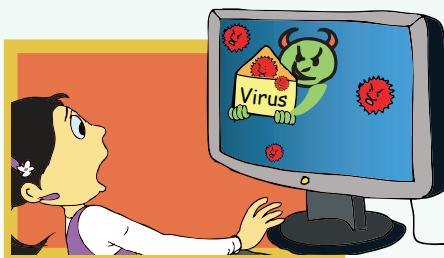
Keep safe by not revealing personal information while using Internet. Personal information includes email Id, house address, photos, phone number and password.



M

Do not Meet up

Meet online friends only in the presence of an adult family member.



A

Do not Accept

Accept e-mails and messages only from people whom you know. Be aware of viruses and spam messages.



R

Check for Reliability

All the information on the Internet may not be correct. Check the reliability of the information with other resources - books, websites or someone who knows.



T

Tell

Tell your teachers/adult family member if you or someone you know is uncomfortable about an online communication.

These guidelines enable users to be responsible towards self as well as others. It sensitizes them to the reach and impact of social networking. Following these rules would go a long way in making use of Internet resources, without compromising on ones' safety.



P

Be Polite

Be cautious in what your post about others. Refrain from making strong statements and personal comments.



L

Think before you Link

Know and manage your friends. Be careful in who you accept as friends. Be cautious of cyber stalking.



U

U are responsible

for your online reputation.

Assume that everything you post on SNS is permanent and communicates your opinions. Everything that is posted online, is available for public view and can easily be tracked.

S

Share selectively.

Keep your profile closed and allocate different view/write permissions.

Be selective in who you allow to write on your wall.



Adapted from: www.kidsmart.org.uk

Social Networking Sites (SNS) and Education

- Although the focus of SNS has been hanging out with friends and having fun, it is important to note that SNS are a powerful medium for education.
- Using SNS for education is now being termed Educational Networking.
- There are a number of SNS devoted exclusively for education. Some examples of SNS for education are Classroom 2.0, Global classroom, Edutopia and Delicious. Through these sites teachers and students can interact with each other.
- SNS allows students to exchange ideas and share content. Student communities interested in a particular topic can sign up for that specific SNS and exchange information.

Moz: Let us look at some SNS and their settings. Settings can be customized by individual users according to their requirements. Facebook has privacy and security settings, some of which are shown in the following screenshots:

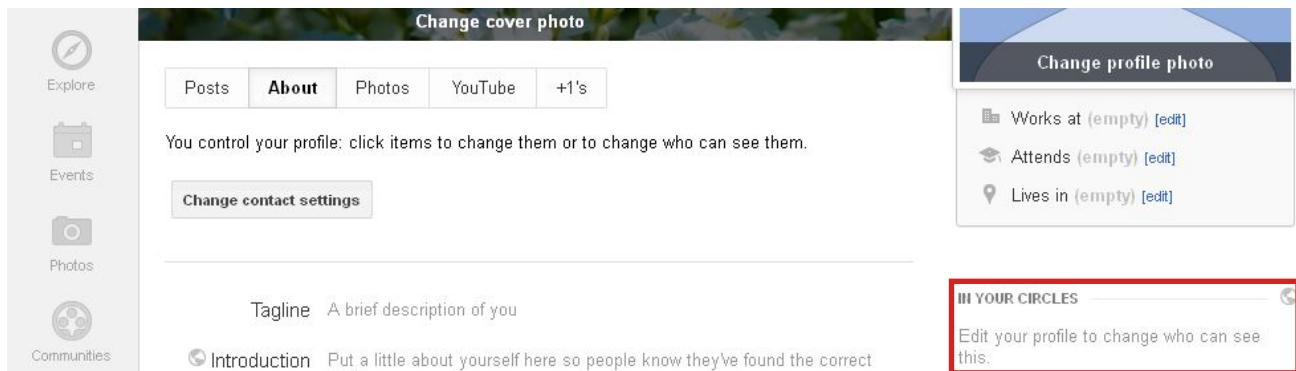
1. How you connect: You can decide about who can send messages, view your data and restrict it to only your friends.

The screenshot shows the Google+ sharing interface. On the left is a sidebar with icons for Home, Profile, Explore, Events, Photos, Communities, and Circles. The main area shows a post titled "Computer Masti Book 8". Below the title is a sharing dropdown menu. The "Your circles" section is expanded, showing options: "Public" (which is selected and highlighted with a red box), "Extended circles", "Friends (0)", and "Family (0)". At the bottom of the menu is a green "Share" button.

2. Privacy: You can control the privacy settings to decide who can access and share your content as Public (Everyone has access), Friends (Only friends have access) or Custom (Provide a specific list of individuals who can access).

The screenshot shows the Facebook sharing interface. On the left is a sidebar with icons for Photos, Communities, Circles, and Local. The main area shows a post input field with placeholder text "Share what's new...". Below the input field is a sharing dropdown menu. A red box highlights the "Add names, circles, or email addresses" field and the "Disable Comments" and "Lock this post" buttons at the bottom of the menu.

2. Profile view: You can also decide what information in your profile is visible and to whom.



Similarly, YouTube will have settings to manage the video uploads, create playlists, comment on content.

Tejas: Till today we were only users of SNS. Now we are not only aware of the many features of SNS, but also the dos and don'ts, pros and cons of SNS.

Jyoti: Besides being a user, can I also build a simple website or create and publish my own content?

Moz: Sure, you will learn how to create blogs and build websites in the next lesson. Meanwhile can you compile a list of specific SNS like:

- SNS for booklovers and features do they offer.
- SNS for educators and activities they can do through these sites.
- SNS for artists and tools that these sites offer

Tejas and Jyoti: Yes, we can put to use all the concepts that we have learnt and come up with the above list!

The infographic consists of four cards arranged horizontally. The first card on the left is titled "Share" and features icons of a computer monitor, a laptop, a smartphone, and a speech bubble. The second card is titled "Enrich" and shows logos for Facebook, YouTube, Flickr, LinkedIn, and Wikipedia. The third card is titled "Limit" and contains the text "Be AWARE Be SMART PLUS". The fourth card on the right is titled "Learning Outcome" and contains the following text:

At the end of this lesson, you will be able to:

- List examples of social networking websites along with the purpose of use.
- Describe features of social networking.
- List pros and cons of social networking.
- List uses of social networking sites for educational purposes.

WORKSHEETS



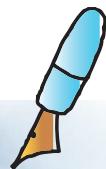
1. For the following tasks, which Social Networking Sites (SNS) would you use and why?
(Examples: Wikipedia, flickr, youtube, facebook, linkedin, amazon, picasa, twitter)

| Task | SNS |
|---|-----|
| a. Refer (find information about) a particular topic for your science project | |
| b. Review a new book and see recommendations made by other readers | |
| c. Share a photo album | |
| d. Upload a home video | |
| e. Discuss a school event management with your friends and teachers | |
| f. Look up professional information about a company or a person | |
| g. Write a short 140 character message | |

2. What are the pros and cons of meeting, chatting online as compared to physically meeting friends.

| Pros | Cons |
|------|------|
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WORKSHEETS



3. Sentil is new to SNS. While setting up his profile for a SNS, he wants to share some of the details. Advise him about sharing and not sharing of details in the profile by using the following table. Give explanation for why you advice so.

| Users on internet | Details of profile that can be shared | Details of profile that should not be shared (of) |
|-------------------|---------------------------------------|---|
| a. Everyone | | |
| b. A Group | | |
| c. Individuals | | |

4. Your mother has asked you to create a list of Dos and Don'ts for your sister for the following:

- a. Going on a one day school trip to the zoo by bus.
- b. Accessing a computer for the first time.

For each one of the above write at least 3 Dos and Don'ts and draw an analogy between these DO's and Don'ts with corresponding SMART/AWARE.

- a. Going on a one day school trip to the zoo by bus.

| Dos and Don'ts | Corresponding SMART rule |
|----------------|--------------------------|
| | |
| | |
| | |

WORKSHEETS



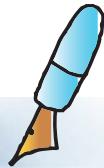
b. Accessing a computer for the first time.

| Dos and Don'ts | Corresponding/AWARE or SMART rules |
|----------------|------------------------------------|
| | |
| | |
| | |

- 5.** Your grandparents are curious to know if they can locate their old acquaintances using internet. Explain how SNS can be used for this purpose. For what other purposes can your grandparents use SNS?

- 6.** What features do you think should
- SNS for booklovers have?
 - SNS for artists have?

WORKSHEETS



4. For the following scenarios what is the action that you will take:

a. You receive an email party invitation from a stranger.

b. Your friend sends a rude message while chatting.

c. You gather information from various resources for project. How do you acknowledge the resources.

d. Your brother is writing to or chatting with elders, you notice that the tone of the language is not polite.

e. Your friend has not bothered to set up the privacy and security setting on her social network site.

f. You receive an email with a hyperlink to download some information for free.

g. You receive an email forwarded by your friend with contents that do not concern you.

h. While buying an item online, besides the payment information, the website asks you to enter your personal details: Mobile number, age, female/male.



ACTIVITY

Level VIII | Lesson 3

Use internet access wherever necessary and complete the activities given below.

1. Compile a list of 20 popular SNS and for each site note the following:

- The main focus area of the SNS
- Give the SNS a category name of your own (education, literature....)
- The features of the SNS
- Number of registered users of the SNS
- Required Age to join the SNS
- Name of the founders/creators of the SNS

To present the above collected information use any visualization tool that you feel is appropriate.

(Can also use an online brain storming and mind map tool like <https://bubbl.us/> to do the task)

2. Divide the class into three groups called Extinct/Critically endangered/Endangered species.

Each group will:

- Make a list of 10 animals in their group category. For example the “Extinct” group will list 10 most extinct/endangered animals today.
 - Share the photos of these species on Picas/flickr.
 - Point to relevant videos of these species on You tube.
 - List of URLs used to create your list, photos and videos.
 - Give pointers to what should we do to prevent extinction.
- 3. Webquests/Webhunts/scavenger hunts are new learning formats where information from the web is analysed to perform a given task .**

i. Read some literature on Webquests and answer the following:

- What are the main components of a webquest?
- Does it involve information gathering or information analysis from given resources?

ii. Design a webquest on Olympic games by creating content under the following headings and give it to your peers to complete:

- Introduction:
- Task: *Frame 10 questions about Olympics* (example: when and where was the first Olympics held?).
- Resource links: *Give list of links where the answers to the above questions can be found.*
- Conclusion: *Summarize the learnings of this webquest.*



A survey: Design a questionnaire to survey at least five adult members of your family and friends on their awareness of SNS. If they already use SNS, how and why do they use SNS. Frame at least 10 questions and compile the answers in a word document. Also draw charts to show the results.

Explore

- Find internet features and tools used by people from various geographic locations, to develop Open source software.
- Find the social media tools and technology used by schools for the purpose of education and communication with students and parents.

- The present generation of students is already aware about social networking. The objective of this lesson is to inform the students about correct practices associated with use of social networking.
- Begin the lesson, by discussing various means of communications. You can specifically focus on mass media communication and discuss tools that are used to communicate with several people simultaneously. Highlight that while some forms still exists in present times, they have undergone a lot of change. You may give an example of radio programs or news that were broadcast only on selected times. These are now available as 24 hour channels and using Internet. Here you can ask students to name any such forums they are aware of. Most likely they would name one or the other social networking site. Use this opportunity to discuss about the psychological reasons to connect socially.
- You may want to discuss various ways in which society has offered opportunities for connecting, personally as well as with others in distant locations. You may talk about pen pals and writing letters to distant.
- Tell the students that with Internet, networking socially has acquired an altogether different meaning. It allows every user to connect with people across various locations in real time and share opinions, pictures, etc. Some of these are used for professional purposes (example LinkedIn), while some are used for personal purposes to connect with friends and family (e.g. Facebook).
- Each of the social networking sites (SNS) offers a variety of services. Question students on what are some of the services they have seen being used. Summarize it with information on all the services that different SNS provide. Refer to the table included in the lesson to describe some of the popular SNS.
- Different SNS are suitable for different purposes. Get the students to appreciate this, by referring to appropriate sections in the lesson.
- Similarly revise the SMART rules of Internet safety, and mention that these apply to every online communication. Talk to them about the PLUS rules, giving examples or case studies to highlight their relevance. You can ask students to do worksheet question 4 at this time.
- Summarize the lesson and ensure that students appreciate the use of social networking for educational and professional reasons and not just entertainment. Reteerate the importance of safety and healthy habits.



Further Reading:

http://en.wikipedia.org/wiki/Social_networking_service
<http://www.bbc.co.uk/webwise/courses/social-media-basics/>
<http://www.digitaltrends.com/features/the-history-of-social-networking/>

Peer pressure is a significant factor in joining social networking. It is important that parents befriend their children and become their partners on the cloud. Though there are age restrictions, young children are on social networking sites. Given that children are likely to access these sites on mobile phone or computers, it is important to understand gains and concerns associated with use of SNS.

Gains

- **Positive relationship building and cultural awareness:** SNS gives an opportunity for social interaction, and building life and social skills. It allows children to meet friends from distant locations helping them become sensitive to cultural differences. They can stay in touch or reunite with friends from their past who may have moved away.
- **Identity:** children can share their interests with others, join groups and engage in positive self expression.

Concerns

- **Privacy:** Children need guidance on how much to share on SNS.
- **Inappropriate content:** Young children have an opportunity to come across inappropriate advertising or websites by clicking on links.
- **Cyber bullying:** Children may not be mature to withstand name calling or getting bullied online.
- **Stranger danger:** An unknown person may befriend them and extract personal information.
- **Brain changes:** Research in neuroscience has indicated that children who use SNS may experience lack of attention span, a need for immediacy for stimulation and a shaky sense of identity (Greenfield, 2011).

Here are some steps to follow if your child joins a social networking site.

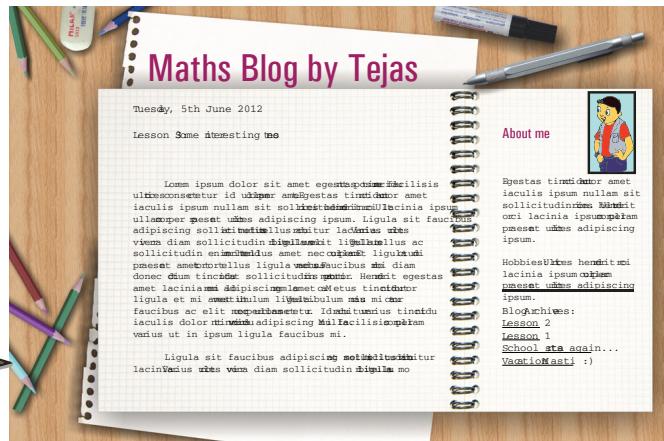
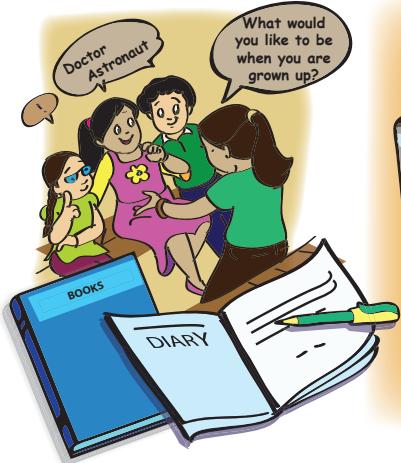
- Discuss why they want to use a social network and what type of content they plan on adding. Talk about gains and concerns of SNS. (Refer above.)
- Teach your child about online safety basics and what kind of personal information should be kept private. Check your child's privacy settings to restrict access and postings.
- Promote honesty. Discuss how lying can hurt relationships and trustworthiness.
- Discuss the harmful effects of social networks with your child. Remind them to only say or do things online that they are comfortable with others seeing.
- Start your own account on the same websites and let your child know you are there. Add her as a friend, so that you can keep track of their activities online.
- Take advantage of parental control features on your computer by restricting inappropriate content.
- Review your child's friend list and ask questions if you see a friend unfamiliar to you.
- Restrict the amount of time kids spent on SNS. Too many long hours can affect their attention span and needs to be avoided.
- Encourage them to tell you or another reliable adult if they feel threatened or awkward because of something somebody said or did online.

Notes:

Writing Blogs and Creating Websites

Aim: In this lesson, you will learn:

- Purpose and use of blogs.
- Guidelines of creating websites and writing blogs.



Tejas: Today we had an interesting discussion in our computer class about how the hobbies of school students have evolved because of exposure to Internet technology.

Jyoti: It was not surprising to note that besides playing outdoor games, many students are now playing online games. There are also many gesture based games where, just by moving your arms and legs you can play games like tennis and football in front of your screen! Many of my friends are also now reading storybooks online (eBooks).

Tejas: The teacher then said that gaming and reading was fine, but asked us if we were familiar with some creative hobby like online writing (Blogging). She has given us a week to explore blogging on our own. We have to then compile a URL list of academic blogs (Maths, Science, and History) for 8th grade students. This will be followed by a blogging competition in which we write our own blogs.

Moz: This sounds exciting. Blog is a short form of web log. A web-log is an online account of an individual's ideas, activities, opinion, and advice. Readers can post responses and comment on your writing. Blogging is very simple and you can start writing your own blogs in a day. But what are your blogs going to be about?

Jyoti: I always wanted to be a fiction writer, so I will start with short stories on my blog. I will also help my mother to create a cookery blog to share her wonderful recipes.

Tejas: I am a sports fanatic, so I will start a blog about my favorite football stars, upload their videos and pictures and share it with my friends. My mother is a very good cook.

Concept

Blogging concept

Blog is a short form for weblog. A web log is an online account of an individual's ideas, activities, opinion, and advice. Readers can post responses and have exchange of ideas and opinions.

Moz: Blogging need not be just a hobby. There are many educational blogs where teachers share experiences and information on their blogs. There are also celebrity blogs where famous people keep in touch with their fans by blogging about their activities. There are also experts in various professions who offer consultancy to answer queries related to their expertise, and earn money through their blogs. Blog owners are also allowed to make money by displaying advertisements on their pages.

Blogging

A blogging website allows the user to:

- Choose blog template
- Post a blog
- Edit a blog
- Post pictures, videos
- Hyperlink blog content
- Archive blogs
- Filter comments
- Use advertisements on blogs
- Cross post blogs on other SNS
- Send auto updates to subscribers
- View blog statistics (no: of views, comments)

Websites

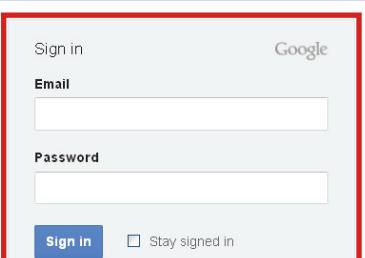
Some popular blogging websites

| Name | Icon | URL |
|----------------|---|---|
| Wordpress |  | http://wordpress.com |
| Google Blogger |  | http://www.blogger.com |
| Tumblr |  | http://www.tumblr.com |
| Posterous |  | http://posterous.com |
| Live Journal |  | http://www.livejournal.com |

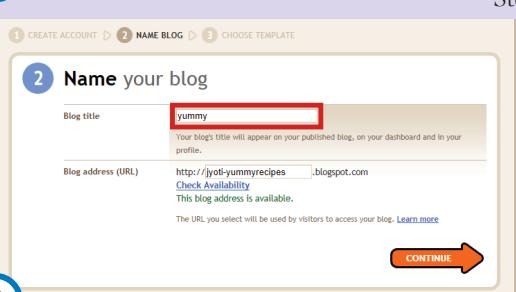
Moz: You already have Google/Gmail accounts; we can try to create blogs using Google blogger.

Creation of blogs

Step 1: Sign



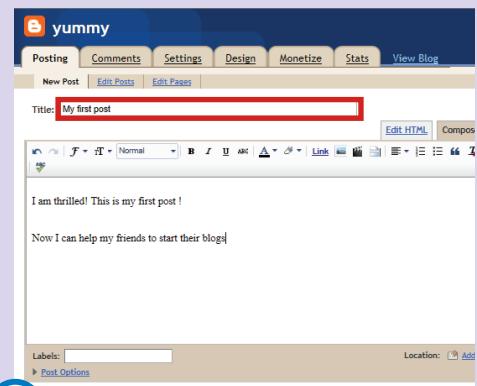
Step 2: Name your blog



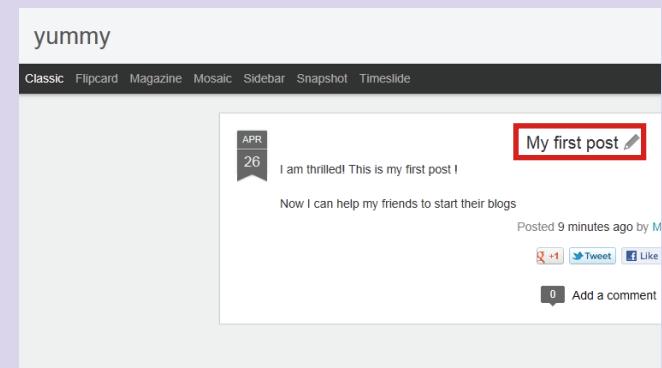
Step 3: Choose a template



Creation of blogs



Step 4: Start Blogging



Step 5: Publish and view Blog

Jyoti: This looks simple. I will explore all the tabs and see how I can edit my post, add pictures and videos, to my blog.

Tejas: I can't wait to start my blog, share it with my friends and see their comments.

Moz: In earlier days, users had to be familiar with HTML (Hypertext markup language) syntax in order to publish content on the Internet. Now you can just compose text and the software takes care of generating the HTML program code automatically.

Tejas: Yes, we saw an option called edit HTML in step 4 while composing the post.

Example

| | |
|---|---|
| <p>Welcome to my Cookery blog</p> <p>Today we will discuss how to prepare coconut chutney!</p> <p>Ingredients</p> <ul style="list-style-type: none"> • 1 coconut grated • 10 gms tamarind • 2 green chillies • 1 spoon of mustard, jeera, hing • 3 spoons oil | <p>HTML code</p> <pre><html> <body> Welcome to my Cookery blog Today we will discuss how to prepare coconut chutney! Ingredients </pre> |
|---|---|

Moz: Today, without coding in HTML, we can create simple websites by using tools like Google sites (<http://www.sites.google.com>) and Wix (<http://www.wix.com>). We can also create complex websites by using tools called Content Management Systems. Some examples are Drupal, Joomla and Tinyurl.

Jyoti: Are these tools and services free?

Moz: The basic features like create html pages, search, templates, storage space and hosting are free. But premium features like customized templates, specific domain names, website support and management, are to be paid for.

Tejas: Some websites that we see are clean and easy to use whereas others are cluttered and loud. Can you tell us some guidelines to design good websites?

Moz: 'Ease of use' of a website is based on two important aspects:

Look : Website communicates its purpose and aim to the user unambiguously.

Feel : Good feel implies that the user would be able to get the required content in a faster way.

| Guidelines | Design guidelines for websites: Visual |
|------------|--|
| | <p>Placement and size:</p> <ul style="list-style-type: none">o Provide importance to the main topic by using blank space (area) around it.o Make the most important topic/element bigger than all other elements present on the page. Follow a hierarchy of sizes to communicate the importance of topics. Ex: Most important (Latest post OR name of the blog) is the biggest and the least important (your email address OR visitor count) is the smallest. <p>Colour and contrast</p> <ul style="list-style-type: none">o Use less (3-4) colours to avoid visual clutter. Take help of colour scheme utilities (like Kuler: https://kuler.adobe.com/, Colour scheme designer: http://colorschemedesigner.com/). These sites show options of colour scheme types and also provide RGB values for the selected colours.o Use consistent colours for the pages of the site, this will lend a uniform look <p>Typography</p> <ul style="list-style-type: none">o Use one font for the headings and one for the rest of the text. Avoid too many fonts on the website. Additionally, avoid variations like bold, italics, condensed, and expanded of the fonts. Use them only for emphasizing. |
| Guidelines | Design guidelines for websites: Interaction |
| | |

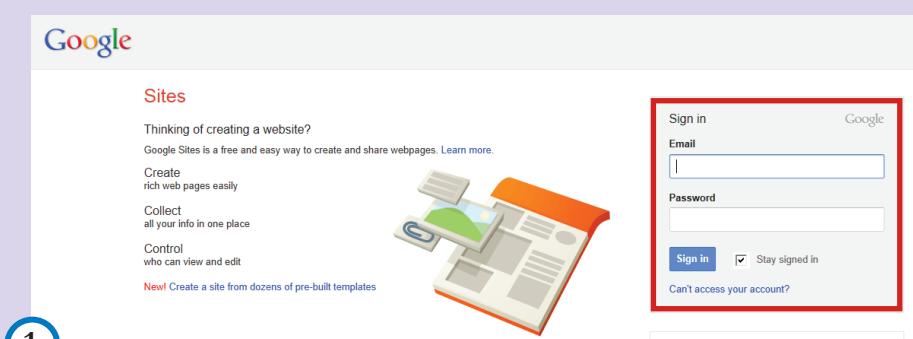
Jyoti: Let us use these guidelines to create a website for a school.

Moz: You can use existing templates and themes provided by the website creating application.

Tejas: Let us use Google website creator.

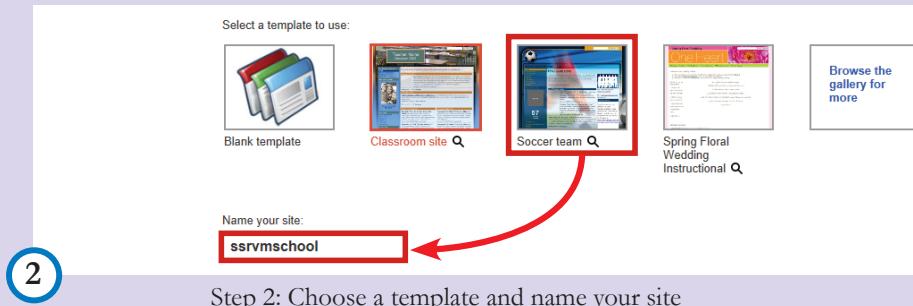
Skill

Using Google website creator to build a simple school website



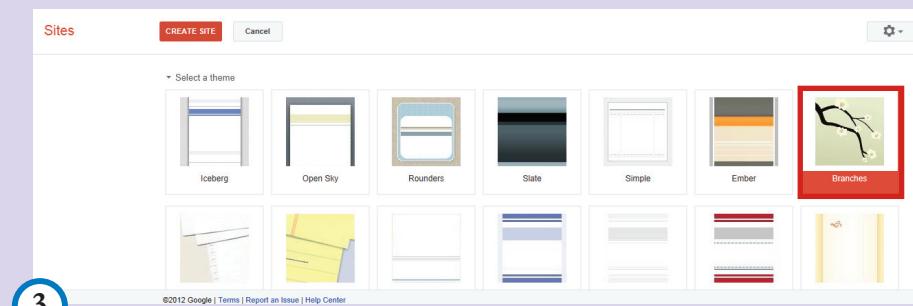
The screenshot shows the Google Sites landing page. It features a 'Sign in' box on the right with fields for 'Email' and 'Password', a 'Stay signed in' checkbox, and a 'Sign in' button. A red circle labeled '1' is in the top-left corner of the sign-in box. Below the sign-in box is a link 'Can't access your account?'. To the left of the sign-in box is a 'Create site from dozens of pre-built templates' section with a newspaper icon.

Step 1: Login with Google account



The screenshot shows the 'Select a template to use:' section. It displays several template options: 'Blank template', 'Classroom site', 'Soccer team' (which is highlighted with a red box), and 'Spring Floral Wedding Instructional'. Below these is a field labeled 'Name your site:' containing 'ssrvmschool', which is also highlighted with a red box. A red arrow points from the 'Soccer team' template to the 'ssrvmschool' input field. A red circle labeled '2' is in the top-left corner of the 'Name your site:' field.

Step 2: Choose a template and name your site



The screenshot shows the 'Select a theme' section. It displays a grid of 12 theme thumbnails: 'Iceberg', 'Open Sky', 'Rounders', 'State', 'Simple', 'Ember', and 'Branches' (which is highlighted with a red box) are visible in the first row; the second row contains 'Linen', 'Yellow', 'Blue', 'Red', 'Grey', and 'Green'. A red circle labeled '3' is in the top-left corner of the 'Branches' thumbnail.

Step 3: Choose a theme and publish



The screenshot shows the published website 'ssrvmschool'. The homepage features a green header with the site name. Below the header is a sidebar with links: 'Mrs Smith's Classroom Home', 'Homework Assignments', 'Extra Credit', 'Contact Me', 'Meet Your Teacher' (with a photo of two students), and 'Word of the Week'. The main content area includes a 'Tip' section, a 'Student of the Month' post featuring a photo of a student named John Doe, and a 'Word of the Week' section. A red box highlights the 'Student of the Month' post. A red circle labeled '4' is in the top-left corner of the post area.

Step 4: Published website with default content which can be edited



The screenshot shows the published website after editing. The 'Student of the Month' post has been updated to feature a photo of a student named Miss Vidya. A red box highlights this post. A red circle labeled '5' is in the top-left corner of the post area.

Step 5: Editing content by using the edit icon

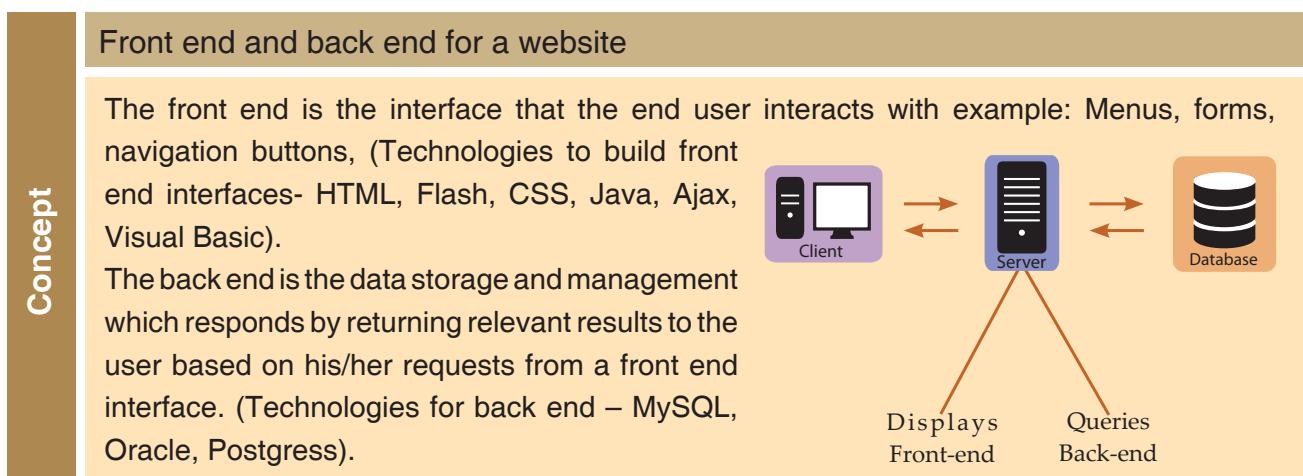
Moz: Now that you know how to build a simple website, imagine that you have a company which is creating a futuristic product. You want to build a website to talk about it. You can include pictures to show how the product will look like. Do this on your own (See Activity 1)

Tejas: We see our parents use e-commerce sites to buy products and ticket reservation sites to book tickets. Can you tell us how such sites work?

Moz: Yes, these are websites where users enter some data and request for information pertaining to this data. For example: **On an ecommerce site:** A user enters name of product (mobile), brand name (Nokia), price range (Rs.5000-Rs.7000). The website searches for all Nokia phones available for the given price range and displays details on the screen.

On an online flight reservation site: A user enters origin, destination, date of travel and number of passengers. The website searches for flights available on these dates and displays the results.

Moz: These websites are built using **front end** and **back end** programming tools.



Sample screenshots of flight reservation system:

Step 1: User query

Example

Front-end data-entry

Flights | **Hotels** | **Trains** | **Small World** | **more** ▾

Search international and domestic flights

Round trip One way Multi city

From (any worldwide city or airport)
Mumbai, IN - Chatrapati Shivaji Airport (BC)

To (any worldwide city or airport)
New Delhi, IN - Indira Gandhi Airport (DEL)

Depart on
1/9/2012

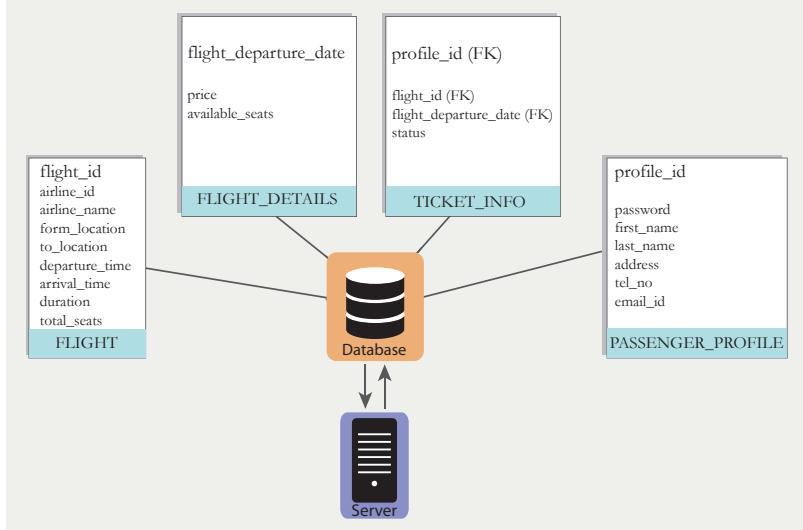
Return on
7/9/2012
Return date

My dates are flexible (for travel within India)

Step 2: Website sends this data to the backend server to determine which flights are available on the given dates for the given destination: Sample tables in the backend database (We will learn more about these in Lesson 9):

Example

Back-end processing



Step 3: The server processes the request and displays the results.

Example

Front-end results display

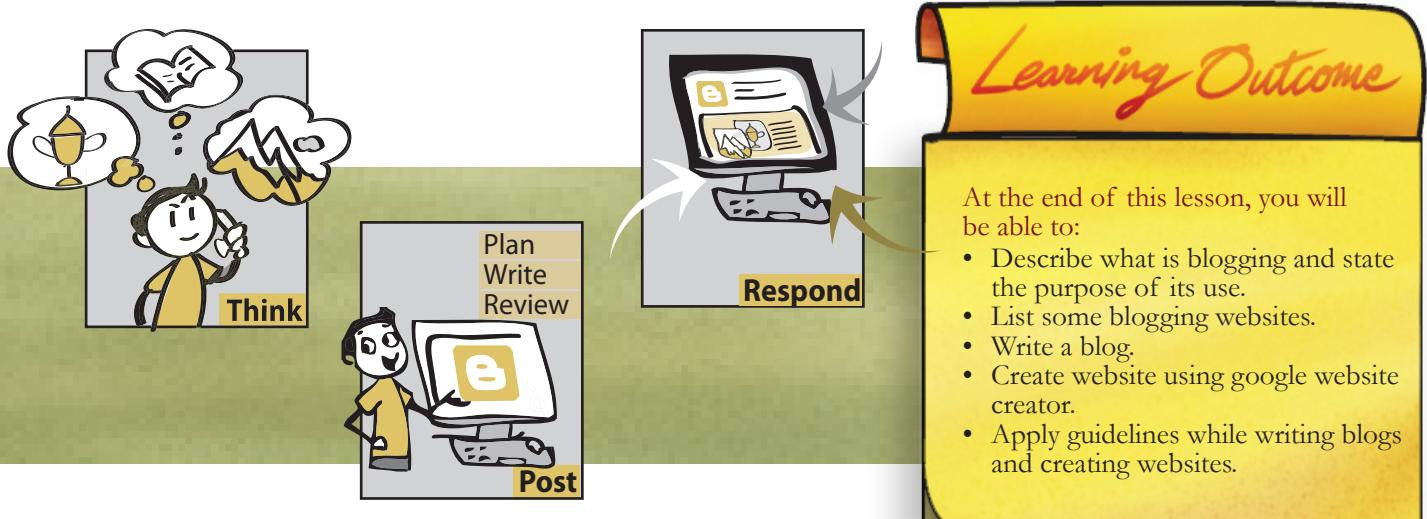
| Flexible dates: Click the dates below to compare fares for that day | | | | | | | |
|---|---------|---------|------------------------|----------------------------------|---------|-------|------------------------|
| Aug 31 Sep 01 02 | | | Sep 06 07 08 | | | | |
| Mumbai to New Delhi | | | | | | | |
| Sort: | Departs | Arrives | Price ↑ | Sort: | Departs | | |
| <input checked="" type="radio"/> | 06:20 | 08:25 | Rs. 4,706 Rs. 4,953 | <input checked="" type="radio"/> | 06:35 | 08:35 | Rs. 4,811 Rs. 5,058 |
| <input type="radio"/> | 07:50 | 10:00 | Rs. 4,706 Rs. 4,953 | <input type="radio"/> | 07:50 | 09:55 | Rs. 4,811 Rs. 5,058 |

| New Delhi to Mumbai | | | | | | | |
|----------------------------------|---------|---------|------------------------|----------------------------------|---------|-------|------------------------|
| Sort: | Departs | Arrives | Price ↑ | Sort: | Departs | | |
| <input checked="" type="radio"/> | 06:35 | 08:35 | Rs. 4,811 Rs. 5,058 | <input checked="" type="radio"/> | 06:20 | 08:25 | Rs. 4,706 Rs. 4,953 |
| <input type="radio"/> | 07:50 | 09:55 | Rs. 4,811 Rs. 5,058 | <input type="radio"/> | 07:50 | 10:00 | Rs. 4,706 Rs. 4,953 |

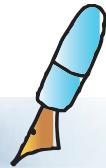
Tejas and Jyoti: When can we learn to program and build these kinds of websites?

Moz: You can start reading the concepts now and you can start the programming in the next level.

Tejas: Till now, we were only users or consumers of websites. Now that we have some idea about how they work, it will be very exciting to build one of our own.



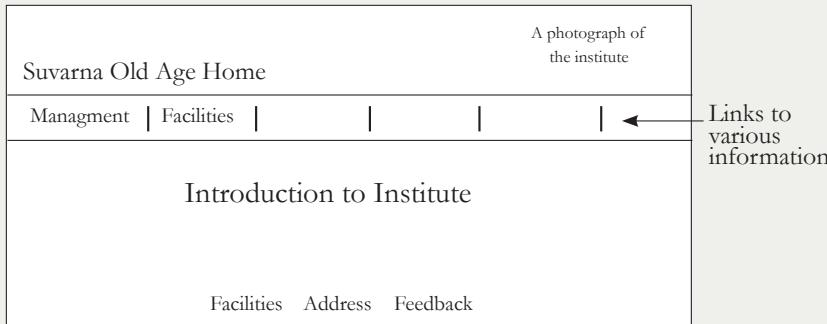
WORKSHEETS



1. An old age home in your locality wants to create a website for their institution. They come to you for help. Can you suggest a content structure (links, navigation.....) which they can use to create the site?

Example

Content structure



Example sublinks: facilities, Maintenance of home, Health services

Website



Give your suggestion of website structure for the following:

Main page design

- List of sublinks
- Description of content in each sublink
- Footer links

WORKSHEETS



2. Write at least five advantages of online blogging as compared to maintaining a personal diary. Write at least two disadvantages of online blogging.

Advantages: _____

Disadvantages: _____

3. List at least 3 pros and cons for the following:

| | Pros | Cons |
|---|------|------|
| a. Booking train ticket online vs physically going to a station and buying the tickets. | | |
| b. Buying a camera online vs physically going to a shop and buying. | | |
| c. Buying fruits and vegetables online vs going to a shop and buying. | | |



ACTIVITY

Level VIII | Lesson 4

Use internet access wherever necessary and complete the activities given below.

1. Build a simple website. Imagine that you have company which is creating a futuristic product. You want to build a website to talk about it. You can include pictures to show how the product will look like.
2. Your Uncle is an enthusiastic traveler who writes extensive notes on the places he visits. He also has many pictures and video clips that he has captures at every location. He always wanted to publish the information, but did not know how to do it. Collect all the data from your uncle, create a plan of what information needs to be published, and proceed to create a travel blog for him.

Under each location you can have:

- About the place:
- How to reach the place:
- Facilities available at the place:
- Pictures and videos of the locations:
- Comments:

Choose an event, such as your teacher is retiring or your sister is graduating. Use one of the online event creation websites to come up with a website which shows the following information:

- About the event.
- Invitation which allows the user to enter his/her response.
- List of invitees.
- Program for the day.
- Some memorable photographs of School/college, teacher/sister.
- Some audio clippings of testimonials by other teachers/family members.

3. Take a subject in your grade and divide the topics among the students. For each topic search for interesting blogs, websites and share the same with the class examples (teachertube...).



Read books: Set up a classroom blog site called “Reading books”.

Ask the class students to select a book of their choice and upload posts on the blog about:

- The gist of the story.
- The characters that they liked.
 - Why they want others also to read the book.
- Creative suggestions about changes in the story that they want to incorporate.
- The posts are open to students for comments and also parents to see what kids and their friends are currently reading.

You can also do this for other topics like “Watching movies” and “Playing games”.

Explore

A cartoon illustration of a person wearing a purple wetsuit and orange fins, diving into a blue ocean. Bubbles are rising from the diver's mouth. The word "Explore" is written in white at the bottom left of the illustration.

1. Find blogs of famous personalities that you admire.
2. Find blogs on topics that would interest your parents.

- The objective of this lesson is to teach students how to write blogs and create websites. It is important that students think through about what they want to write a blog on or what kind of content they want on the website, before getting onto the computer.
- Show a sample blog of a professional that you think students would admire and a website of an institution they would be familiar with. For instance, an astronaut, a writer, a scientist or the school principal and school website. While they are looking at the blog or website, ask them questions that allows them to analyze the various elements such as layout of the page, the manner in which the content is organized and so on. Let the students, explain what is a blog; refer the concept box and info box included in the lesson.
- Ask the students whether they want to create such websites themselves or write a blog about a topic that interests them. Talk to them about blogging websites and take them through the steps to create a blog. Refer the skill boxes included in the lesson for this. Students are already familiar with online content sharing. Ask questions to recall their knowledge about it and build on it to give a demo of creating a blog. You can ask students to do worksheet questions 1 and 2 at this time. Each of these questions are case studies and need to be discussed in the class, before the students write their answers individually. Note that it is expected that the teacher should not dictate the answer. Each student will have different answer.
- While you are doing this, get the students to revise how stepwise thinking is applied in this activity. It is important to ensure that students are able to appreciate that thinking skills are required while working on any application, and in fact to most of our activities in general.
- Summarize the blog creation process and ask students to do activity 1 at this time.
- Give a demo of how to create a website. Students can refer the skill boxes included in the lesson and follow the steps. Since Google website is highly user friendly, this is selected as an example in the lesson. However, you may use an alternative. While learning presentation skills, students have been taught about design elements in the last stage of Impress. Revise these and ask them to apply it to creating websites as well. Refer the guideline box included in the lesson.
- Students have been browsing as well as observing others perform online transactions such as booking of tickets. Discuss what is e-commerce and how Internet has altered the way shopping or purchase can be made with convenience. Do worksheet question 3 along with students, discussing each case at a time.
- You can give a demo of train booking and ask questions on how the website gives information about particular combination of search. Now explain the backend process. Refer the concept box in the lesson to explain this. Tell them that they would learn more about it in the database lesson soon.
- Summarize the lesson, by revising all the important concepts learnt in the lesson. In order to practice the skills learnt in the lesson, ask students to do the activities included in the lesson.

Further Reading:

http://www.google.co.in/educators/p_blogger.html
<http://ithinkmaths.wordpress.com/>
<http://www.sciencenewsforkids.org/>
<http://scholasticworld.blogspot.in/>
<http://kv-library.blogspot.in/2012/07/kvpy-kishore-vaigyanik-protsahan-yojana.html>

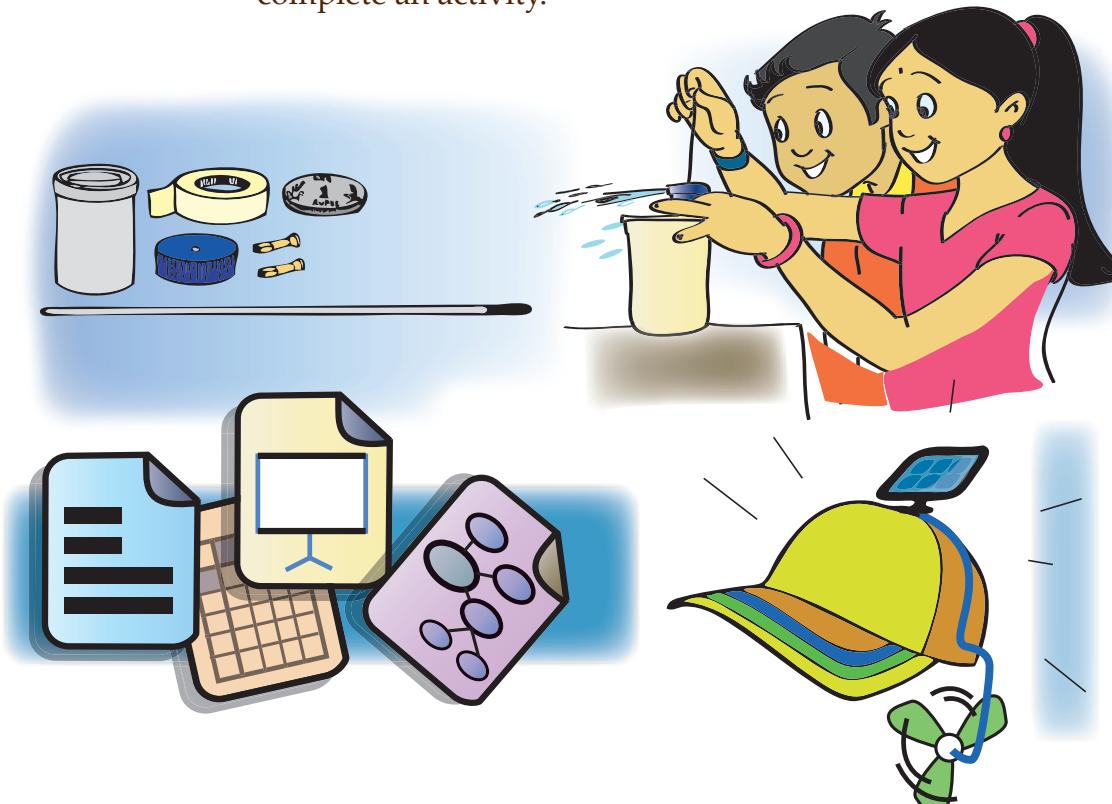
Notes:

Innovation and Creativity: Integrated Activities



Aim: In this lesson, you will learn:

- Application of multiple thinking skills for an activity.
- Application of multiple office applications and Internet tools to complete an activity.



Tejas: In the inter school Science symposium the challenge was to build a solar energy based product and build a prototype.

Jyoti: We had a brainstorming session, then a step by step planning of how to gather information and analysed the information to design the product. We gave a presentation about product and it's design to our class and Science teachers for their suggestions and comments. We built the prototype of a hat with a fan which runs with solar energy for the symposium.

Moz: Excellent innovation and creativity! This goal was achieved by recalling, applying and integrating various concepts and skills that you learnt. The solar panel on the hat is quite interesting!!

[Note to the teacher: A list of projects that require multiple thinking skills and multiple applications are given below. Do a few projects that would be interesting to your class.]

Know your class: You have to study the kind of food preferred by students of your class. For this, do the following activities:

- Use a word processor to create an empty table which includes headings such as name, gender, dress/food preferred.
- Upload this file using Google docs, so that all the students can access the file and enter their respective data.
- After everybody has entered their data, print this table.
- Count the number (frequency) for each kind of dress/food and enter the same into a spreadsheet. Now, your sheet will have gender, kind of dress/food and frequency for each. Create a bar graph to represent the dress/food preferences.



Food prefered by Students

Recall and Apply



Step wise thinking, Gathering information, Analysis.



Word processor, Spreadsheet, Internet.

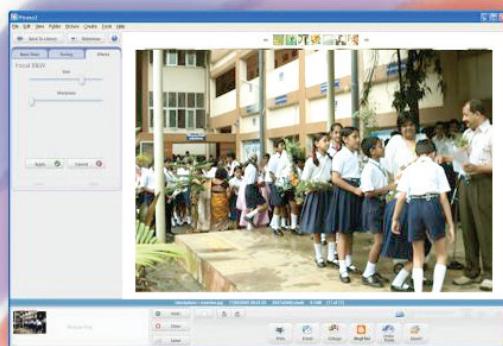
Concept

Steps of gathering information

- Step 1: Identify the goal and state it clearly.
- Step 2: Analyze the goal and identify the requirements for sub-tasks.
- Step 3: Identify the information required to accomplish each sub-task.
- Step 4: Identify resources that provide information about each sub-task.
- Step 5: Record information in a note-book or paper.
- Step 6: Consolidate and organize the information gathered from various resources.

Digital photo album: You collected photographs of different events across the academic year. Create a photo album by doing the following activities:

- Scan the photographs. You may need to transfer the files from external devices such as digicam or mobile phone, onto your computer.
- Organize these images in folders based on participants, grades, and events. Order them according to when these events occurred during the academic year.
- Create a digital album of memories, using a content sharing website such as flickr or Picasa.
- Create a web link for your class and send this link to your classmates. You can mark a copy to your computer teacher as well.



Recall and Apply



Stepwise thinking, Organizing (gathering and organizing information).



- Devices (webcam, mobile phone, scanner) Internet (email, sharing on website).
- Applications on internet like Flickr or Picasa allow you to share photographs with family and friends online. This avoids exchange of bulky attachments of image files.

Concept

Steps of Stepwise thinking

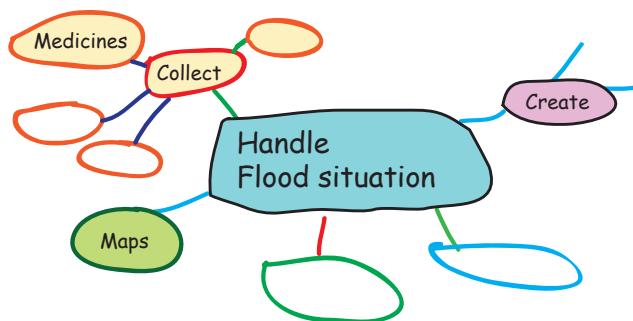
- Any activity has a sequence of steps.
- First list the main steps of the activity.
- Then, for each main step, list the detailed steps.
- Listing the steps helps in carrying out the activity easily.

Handle a crisis: You have to share ideas on disaster management in a flood affected area. For this, do the following:

- Use the strategy of brainstorming to generate ideas. Then synthesize the ideas and create a mind map of the same.
- Browse the Internet to gather more information on how to deal with flood situations. Collect images, data on recent floods in areas of your interest or vicinity.

Make a note of the URLs visited and a brief summary of the content in a word processor or Google docs.

- Tag flood affected areas of your chosen vicinity on Google map.
- Create a presentation on this topic. For this, you can include the mind map and other information gathered above.
- Imagine that you are organizing a donation drive in your neighborhood to collect clothes, money and food for flood affected area. List the steps required for this activity. Describe how will you reach out to people and keep track of the different items collected.
- Create a group e-mail for your class. Share your above ideas with your class and mark a copy to your computer teacher.



Recall and Apply



Stepwise thinking, Logical reasoning, Gathering information, Brainstorming.



Internet (sharing websites email).

Concept

Steps of Logical reasoning

- Identify the goal and understand the information available.
- Analyze the information and conditions.
- Work out a solution in a step-wise manner. “What”, “When” and “Why”, are questions that can help in thinking logically, to find out “How” to reach the goal.

Analyze and decide:

- Examine each category and its subcategories.
- Analyze the information and finalize the categories, subcategories relevant to the goal, by:
 - Decision to merge some categories.
 - Decision to drop some categories or subcategories.
 - Decision on whether more information is required.



• Draw your mind map here.

Become a designer: You are asked to design a T-shirt for your city marathon. You can design different T-shirt for groups supporting different causes. Each group of student can select one of the following causes: (i) save environment, (ii) save the girl child, (iii) educate the under privileged, (iv) empowering the disabled. Now follow these steps to complete the activity:

- Conduct a survey of students of your class to collected information on preferred colour. Ask them to suggest suitable tag lines to be printed on the T-shirt for your cause.
- Use drawing tools of a word processor/presentation to create a logo to be printed on the T-shirt.
- Upload this on Google docs and share it with the class.
- Ask students to vote for the preferred choice of logo. For this you can give labels to each logo and ask students to enter their response. Create a Google spreadsheet for this so that students can enter their inputs.
- Create a presentation to launch the T-shirt.



Recall and Apply



Gathering information, Analysis and Decision making, Creativity.



Word processor, Presentation, Internet (google docs).

Create a product: You have to design a product for senior citizens. One group of students decide that they will create a gadget labelled, Bandhu, that will alert them about routine events of the day and assist in case of emergencies. The other group of students decides to create a special computer labelled Mitro, for adults who are semi-literate/non literate and want to communicate with their children.

For this activity do the following:

- Interview senior citizens in your locality to conduct a survey of:
 - For Bandhu: What routine events do senior citizens need to do everyday? For example, taking medicines, store their medical history and important contacts, and alert them for banking/shopping/visits to certain places.
 - For Mitro: What are the minimal applications that senior citizens would need in this special computer? For example, create documents, keep record of expenses, email, take photographs and chat with friends and relatives.
- Create a Google spreadsheet and enter the data. The entire class can enter the data.
- Identify the features that are required by most of the survey participants in your product. You can apply your skills to do computations in a spreadsheet, such as count frequency, draw graph to illustrate.
- Create a document that summarizes your findings of the survey. Explain the design of your product. Use draw tool options to create images of the user interface of the product.
- Brainstorm for deciding a suitable name for your product.
- Create a presentation to share your product details.



Recall and Apply



Brainstorming, Logical reasoning, Decision making, Designing.



Presentation, Internet.

Concept

Steps of decision making

- Identify the goal.
- Gather and consolidate information.
- Identify the constraints (conditions to be satisfied).
- Use logical thinking to identify choices that satisfy the constraints.
- Take the decision.



- Draw your invention's interface here.

Responsible student: Create a collage to educate your school students about measures one needs to adopt while using Internet. Include the tips of safety measures associated with surfing, online communication such as e-mail, chatting (SMART). Warn them about phishing, teach them about responsible use of Internet resources (AWARE). To do this activity, follow these steps:

- Collate information and images from different resources such as Internet, Computer Masti books.
- Categorize them into sections of related information.
- Use appropriate software to create the collage.
- Upload the collage on a content sharing website and share this link with your friends and computer teacher.



Recall and Apply



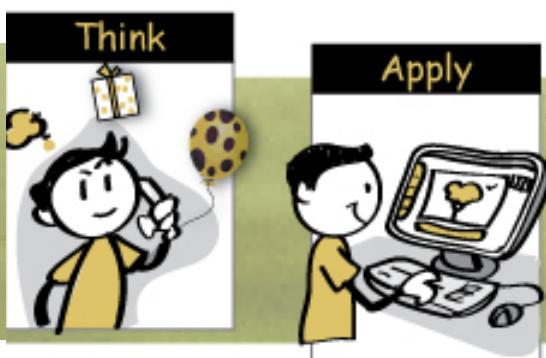
Gathering information. Stepwise thinking, Categorization, Creativity, Collaboration.



- Image editing, Internet (sharing websites).
- Poster: Internet safety rules and AWARE.

Multiple ways of categorization

- Information is grouped and categorized for ease of understanding and recall.
- Information can be categorized in multiple ways, based on the features and relationships identified in the data.
- There is no one correct way of categorization. As long as your reason for grouping items in one way or the other is clear, the number of categories can vary.
- Labels for each category can be selected based on the common features of items within the category.
- One item can also belong to multiple categories.



Learning Outcome

At the end of this lesson, you will be able to:

- Apply thinking skills to do an activity.
- Apply multiple office applications and Internet tools to complete an activity.

Explore

1. Find out the process cycle followed in companies for product design.
2. What are user studies and why are these important while designing a new product?

- The objective of this lesson is to revise the knowledge of different applications and thinking skills covered so far. In addition, it enables students to identify suitable applications according to purpose. Besides, it provides students opportunity for creative expression.
- You can divide the class into smaller groups of five to ten students to do each activity. Most of the portions of each activity require computer lab use. So provide sufficient class time for doing this activity.
- Students may need guidance on how to conduct interviews and survey. Help them design the questionnaire.
- While students are discussing ideas for each activity, intervene to moderate the discussion to ensure fair participation of each student.
- Keep relevant chapters of the books handy so that students can refer the associated skills.
- After all the activities are completed, highlight the relevance of this lesson. You can use this opportunity to reinforce group work and creative thinking abilities of the students.
- Refer the sample rubric on the next page. Create similar rubrics for each of the activities to assess student's performance.



Further Reading:

<http://www.thinkingclassroom.co.uk/ThinkingClassroom/ThinkingSkills.aspx>
https://www.googlesciencefair.com/en_US/login
<http://www.google.com/intl/en/events/sciencefair/index.html>

| Sample Rubric for assessing a Mind map | | | | |
|--|---|--|---|---|
| | Excellent | Good | Average | Needs Improvement |
| Depth of content | Brings out concrete grasp of the content. | Brings out most of the content. | Brings out only basic ideas of the content. | Brings out minimum topics and some topics are missing. |
| Use of central image/word | Stands out meaningfully and connects the key ideas and sub ideas accurately. | Clear use of picture or image or word that relates to key ideas. | Present but difficult to comprehend the way it has been connected to the key ideas. | Incorrect. |
| Use of images/symbols | Most categories are enhanced with simple symbols or diagrams/images. | Some categories are enhanced with simple symbols or diagrams/images. | A few categories are enhanced with simple symbols or diagrams/images. | The Mind map includes a few images or no images. |
| Use of colour | Effective use of colour, codes, or links that brings clarity to the Mind map. | Clear use of colour, codes, or links. | Inconsistent use of colour, codes, or links. | A little or no use of colour, codes or links. |
| Organisation of ideas | Clear connection of ideas from most complex to least complex ideas. | Clear connection of ideas. | Inconsistent connection of ideas. | No connection between ideas. |
| Use of keyword | Accurate keywords are used as per the theme of the Mind map. | Few but correct keywords are included in the Mind map. | Few and vague keywords are included in the Mind map. | Very few and irrelevant keywords are included in the Mind map. |
| Overall presentation | The Mind map is neat and includes accurate information. | The Mind map includes the required information but lacks clarity. | The Mind map is well presented but some information is missing. | The Mind map is not presented neatly and difficult to understand. |

Notes:



ASSIGNMENT

Aim: In this assignment, you will revise:

- Applying thinking skills and application skills to do an activity.

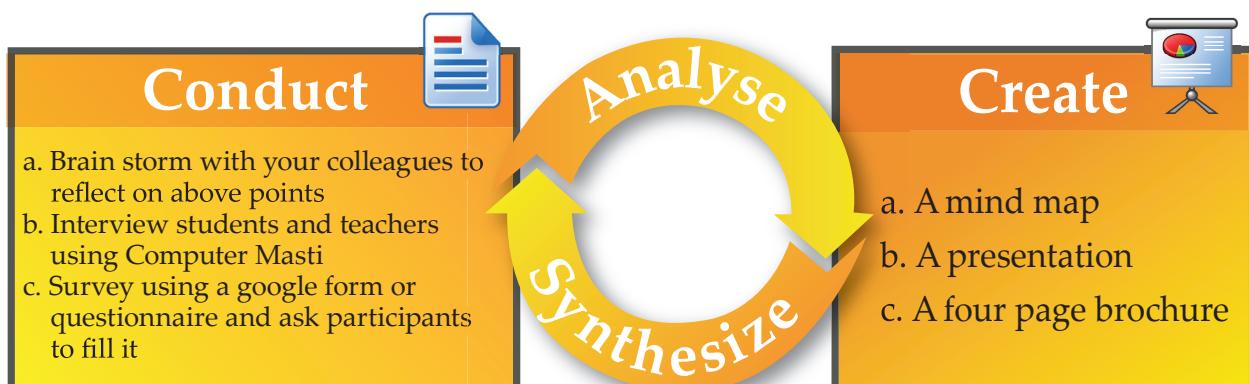
- 1. Computer Masti Sales Head:** The Computer Masti author team wants you to create a product presentation for Computer Masti. This should include salient features of the book series, key differentiators from other such textbooks, testimonials of students and teachers using the product, images of Computer Masti classrooms and lab, and users of the book.

You can do the following:

- Read 'About this book' and back cover page.
- Visit the website www.computermasti.com to get more details.
- Design a questionnaire to survey opinion of students and teachers using Computer Masti.
- Surf for Computer Masti on Social networking sites to connect to Computer Masti stakeholders.



- 2. Computer Masti Product Head:** You have to study the Computer Masti learning experience of students and teachers. Gather data on what are the most and least preferred - (i) topics, (ii) narrative style of the lesson, (iii) worksheet questions, and (iv) activities and projects.



- The objective of this assignment is to provide students with an opportunity to apply the thinking and computer usage skills that Computer Masti has nurtured so far.
- The first project expects students to create a product presentation for Computer Masti. This requires not just presentation skills, but also capacity to think through an activity, gather information systematically, use multiple forms of representation, as well as skills with computer applications and tools.
- As a facilitator, you should discuss the activity in the class; your role essentially would be to motivate the students and encourage them to do the project independently. You may help them gain access to relevant material, via Computer Masti website.
- The teacher is expected to create a rubric to evaluate student performance on these projects. If possible, ask students to showcase their project in school level event.



Further Reading:

www.cse.iitb.ac.in/~sri/papers/CSC-April2010.pdf
<http://www.computingatschool.org.uk>
<http://csta.acm.org/Curriculum/sub/K12Standards.html>
www.khanacademy.org/

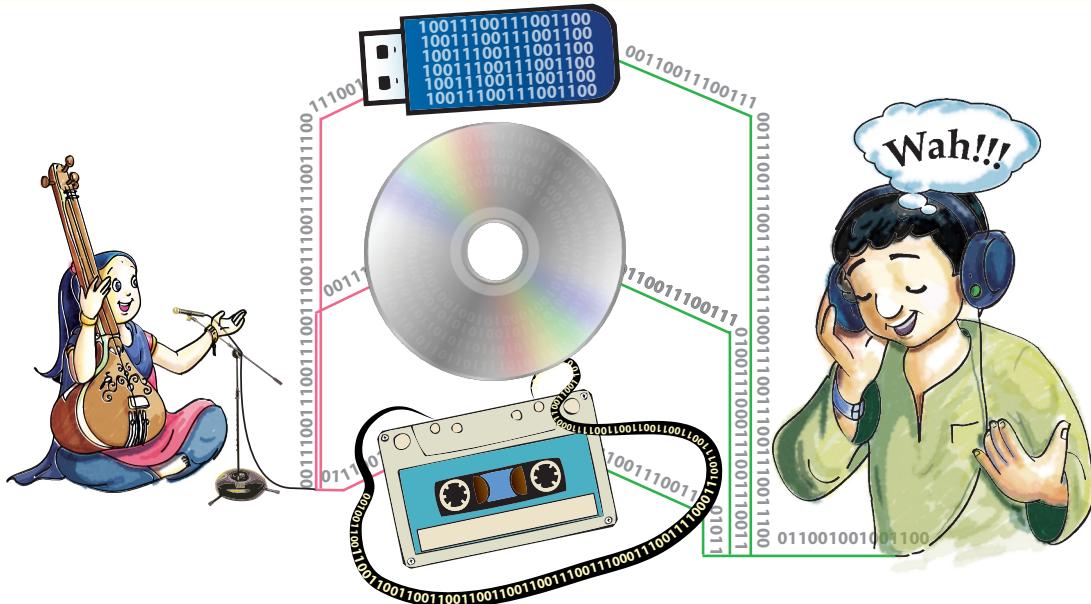
6

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Binary number system: Bits and Bytes

Aim: In this lesson, you will learn:

- Binary number system, and its use in computers.
- Units of measurement for files and backup devices.



Jyoti: How does a computer store music?

Moz: Computers store all data, like information, instructions, files, images, sound and video, as numbers.

Jyoti: Is there some code to represent each letter in the alphabets? This will be necessary for saving a text document.

Moz: You are right. To represent an image, each pixel or the coloured dots needs to have a code.

Jyoti: Different sounds in a music file also have to be given a code.

Moz: Yes. All the data has to be converted to numbers in binary form to be processed by the computer. The word binary means two. The binary form code is formed by using only two values '0' and '1'. This is called the **binary number system, or the base-2 system**. Each digit in a binary number is called a **bit**. A sequence of 8 bits is called **byte**.

0 or 1 Bit 1 0 1 0 0 0 1 0 Byte

Tejas: Why are only two digits used to form the code?

Moz: The reason computers use the base-2 system is because it makes it a lot easier to implement programs and data with current electronic technology. Bits can be implemented in many forms. In most modern computing devices, a bit is usually represented by an electrical voltage or current pulse, or by the ON - OFF state of a switch in a circuit.

Examples

Binary code

| Alphabet | Binary code |
|----------|-------------|
| A | 1000001 |
| Z | 1011010 |

Binary code names of Tejas and Jyoti

| Name | Binary code |
|-------|--|
| Tejas | 01010100 01100101 01101010 01100001 01110011 |
| Jyoti | 01001010 01111001 01101111 01110100 01101001 |

Jyoti: 'J' (01001010) and 'j' (01101010) have different code to distinguish between the upper case and lowercase.

Tejas: Each letter has a length of 8 bits, or 1 byte.

Moz: Right. Note that *bits* are abbreviated by 'b' and *bytes* by 'B'.

Jyoti: Oh! So when a file has a size of 1 KB then it means the file has 1000 bytes = 8000 bits.

Concept

Binary numbers

A binary number is formed by the combination of '0' and '1'.

Bit 0 1

A bit is the smallest unit of data in computer processing.

- Bit is derived from the words Binary digit.
- A bit represents a digit in the binary system.
- A bit can only have the value 0 or 1.
- An example: 1101 is a binary number 4 bits long.

Byte 1 1 1 0 1 1 1 0

A Byte is a group of 8 bits.

- Bytes are the standard unit of storage in a computer.
- An example: 10110111 is a byte and can represent data like text, pixels or sound in a computer.

Units of measure:

- A Kilobyte (KB) is usually used to denote 1000 bytes. Sometimes it is used to denote 2^{10} bytes or 1024 bytes. The term kibibyte (KiB) is sometimes used to denote strictly 1024 bytes.
- A Megabyte (MB) is 1000 kilobytes. Sometimes it denotes 1024 KB.
- A Gigabyte (GB) is 1000 Megabytes.
- A terabyte (TB) is 1000 Gigabytes.

Moz: there is a binary code for each character on your keyboard. You can also convert numbers from decimal to binary. For example, the number 10 in decimal is 00001010 in binary.

01

Binary

A
1000001

Conversion

Bytes

KB
MB
GB
TB

Units of measurement

Learning Outcome

At the end of this lesson, you will be able to:

- Explain what is binary number system and state its purpose.
- Convert words into binary code.
- Distinguish between various units for measurement of file size/capacity of backup devices.

WORKSHEETS


1. Fill in the blanks.

- a. _____ and _____ are digits in the binary system.
- b. Binary numbers can represent data like _____, _____ and _____ in computers.
- c. A Byte is a group of _____ bits.

2. Match the following.

| | |
|---------|-------------------|
| 1. KB | a. 1024 megabytes |
| 2. Byte | b. 1024 bytes |
| 3. GB | c. 1024 gigabytes |
| 4. MB | d. 1024 kilobytes |
| 5. TB | e. 8 bits |

3. Each alphabet is one byte long, so how many bytes do you think the following sentence has?

“The reason computers use the base-2 system is because it makes it a lot easier to implement them with current electronic technology.”

4. Write your name in binary code. Use the table given to find the code for each letter of your name.

Your Name:

| Letter | Binary code (ASCLL) |
|--------|---------------------|--------|---------------------|--------|---------------------|--------|---------------------|
| a | 01100001 | n | 01101110 | A | 01000001 | N | 01001111 |
| b | 01100010 | o | 01101111 | B | 01000010 | O | 01010000 |
| c | 01100011 | p | 01110000 | C | 01000011 | P | 01010001 |
| d | 01100100 | q | 01110001 | D | 01000100 | Q | 01010010 |
| e | 01100101 | r | 01110010 | E | 01000101 | R | 01010011 |
| f | 01100110 | s | 01110011 | F | 01000110 | S | 01010100 |
| g | 01100111 | t | 01110100 | G | 01000111 | T | 01010101 |
| h | 01101000 | u | 01110101 | H | 01001000 | U | 01010110 |
| i | 01101001 | v | 01110110 | I | 01001001 | V | 01010111 |
| j | 01101010 | w | 01110111 | J | 01001010 | W | 01011000 |
| k | 01101011 | x | 01111000 | K | 01001011 | X | 01011001 |
| l | 01101100 | y | 01111001 | L | 01001100 | Y | 01011010 |
| m | 01101101 | z | 01111010 | M | 01001101 | Z | 01111010 |



ACTIVITY

Level VIII | Lesson 6

1. Note the size of RAM and hard disk of your computer in KB, MB, GB.
2. Select a text file, audio file, video file, image, a presentation file (ppt) on your computer and note their file size.
3. Open an image in an editor and reduce the file size.
4. Convert from binary to decimal and decimal to binary using the following link.
<http://easycalculation.com/binary-converter.php>

Binary To Decimal or Hex Converter

Convert Binary To Decimal or Hex :

Insert

Binary Value

Decimal

Hex

| Conversion Code - Chart | | | | | | | | | | | | | | | | |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| DECIMAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| HEX | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| BINARY | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 | 1000 | 1001 | 1010 | 1011 | 1100 | 1101 | 1110 | 1111 |

DECIMAL to Binary and HEX converter / convertor

Insert

Decimal Value

Binary

Hex

| Conversion Code - Chart | | | | | | | | | | | | | | | | |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| DECIMAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| HEX | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| BINARY | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 | 1000 | 1001 | 1010 | 1011 | 1100 | 1101 | 1110 | 1111 |



ACTIVITY

Level VIII | Lesson 6

5. Go to the url: http://forums.cisco.com/CertCom/game/binary_game_page.htm and play the binary game.

The screenshot shows a binary conversion game. At the top, there's a row of buttons labeled 128, 64, 32, 16, 8, 4, 2, 1. Below this is a large empty black area for input. In the center, there's a numeric keypad with buttons for 7, 8, 9, 4, 5, 6, 1, 2, 3, DEL, 0, and backspace. Below the keypad, a row of pink buttons represents binary digits (0s) followed by an equals sign and a green input field containing the decimal value 34. At the bottom, another row of buttons is labeled 128, 64, 32, 16, 8, 4, 2, 1. To the right of the game area is a sidebar with the word "BINARY" in large letters. It displays the current Score (0), Level (1), and Lines Left (15). At the bottom of the sidebar are four buttons: Pause game (with a pause icon), Music Off (with a speaker icon), Change Music (with a double arrow icon), and End Game (with an X icon).

Explore

1. Find out if there are applications to convert numbers into various bases (example libmath-basecalc-perl).

- The objective of this lesson is to teach students how a computer stores data. Explain the concept of binary number system.
- Give an example of how a particular word is saved by the computer in the binary number system form. Explain the concept of bit and byte.
- Students are already aware of units of measurement of computer memory and Internet speed. Revise these and teach about various units such as KB, MB, GB, and TB. Refer the concept box included in the lesson for this.
- Summarize the lesson and ask them to solve the worksheet and do the activity included in the lesson.



Further Reading:

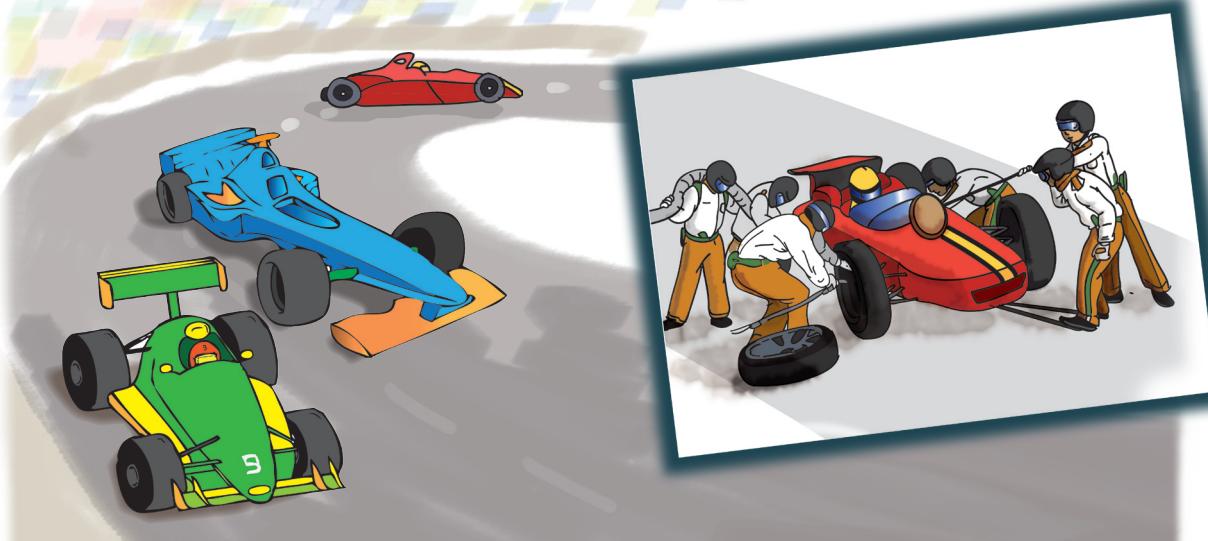
<http://www.igcseict.info/theory/0/bits/index.html>
<http://www.howstuffworks.com/bytes.htm>



System configuration and Troubleshooting

Aim: In this lesson, you will learn:

- Desktop components and management.
- Basic system administration of a desktop.
- Basic troubleshooting of devices, and applications.



Tejas: I was watching F1 formula car racing. There is a lot of customization done in these cars. Some technical requirements like speed, tyres, need to be the same in each car. But the controls available on the steering wheel, the seat of the driver are customized.

Jyoti: Maintenance and trouble shooting is done by a team of engineers.

Mo: Can you customize a desktop as per your requirements?

Tejas: Yes. Some of the customizations are, install devices, change the look of the desktop and install applications that we want to use.

Jyoti: Some applications require system administrator help for installation and configuration.

Moz: Right. Do you need engineers to troubleshoot a computer?

Tejas: Some of the trouble shooting can be done by the user. For example, if a network is not working we can find if the network cable is connected to the switch or not.

Jyoti: We sometimes have to use the administrator login, to troubleshoot. For example, if the network is not working and the cable is connected, we need to check the network settings. A user cannot check this or change the settings.

Moz: Right. The role of using a administrator login is called system administrator. A user can become a system administrator. Similar to the formula 1 car team of engineers, there are trained system administrators who specialize in installation, maintenance and troubleshooting of computers and networks.

Customization and Troubleshooting

A user can do some of the customization and trouble shooting on a desktop.

Sometimes the user has to use the administrator login for these tasks.

Sometimes you may need the help of a trained system administrator to customize and trouble shoot.

Moz: Let us customize the desktop as per your requirements and look at customizations that require system admin login. Later we can look at basic troubleshooting that a desktop user should know.

Basic components of a desktop

Moz: What are the components of a desktop and their uses?

Jyoti: The desktop has a menu bar from which we can find applications. The task bar shows minimized windows of opened applications. (see Fig. 1)

Tejas: We also have some area to save and access files on a desktop.

Jyoti: In this area we can have shortcuts of applications that we frequently use. The files, directories and shortcut to applications are available as icons on this space.

Moz: This area where you can save and access files is called **workspace**.

Jyoti: The desktop also has a panel from where we can launch applications.

Moz: This panel is called the **application launch panel**.

Tejas: The windows of applications that we open are also visible on a desktop.

Moz: Right. A Desktop, through a graphical user interface (GUI) provides these basic components (Menu bar, Workspace, Task bar, Application launch panel) to a user.

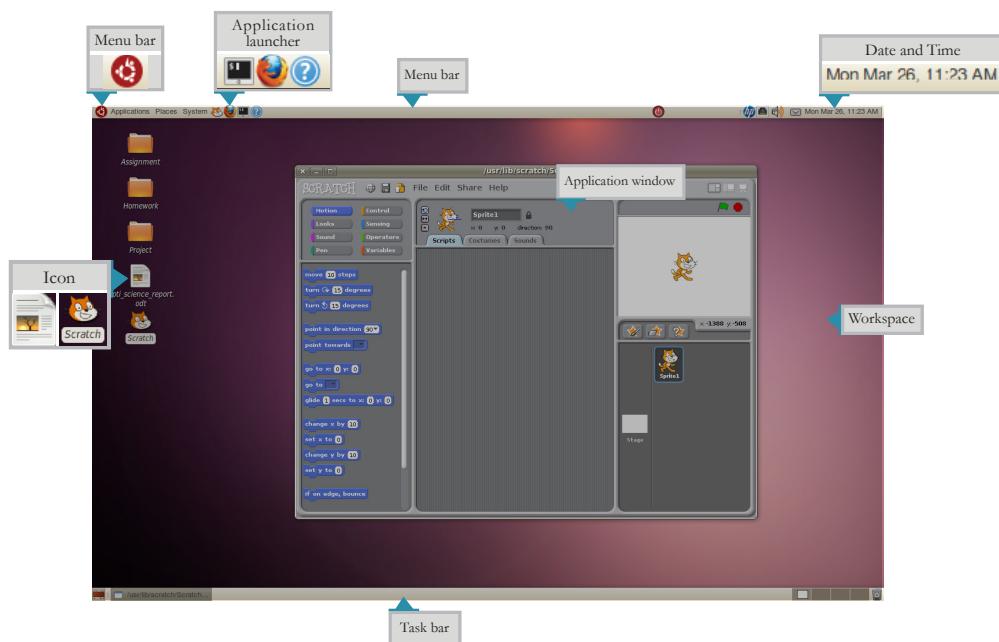


Fig.1 Ubuntu desktop

Moz: You have Gnome desktop on your lab computer. Have you seen any other desktops?

Jyoti: Yes. The desktop of a Microsoft Windows OS has different look and feel. But it has the same basic functions of providing access to applications, windows, and workspace. (see Fig. 2)

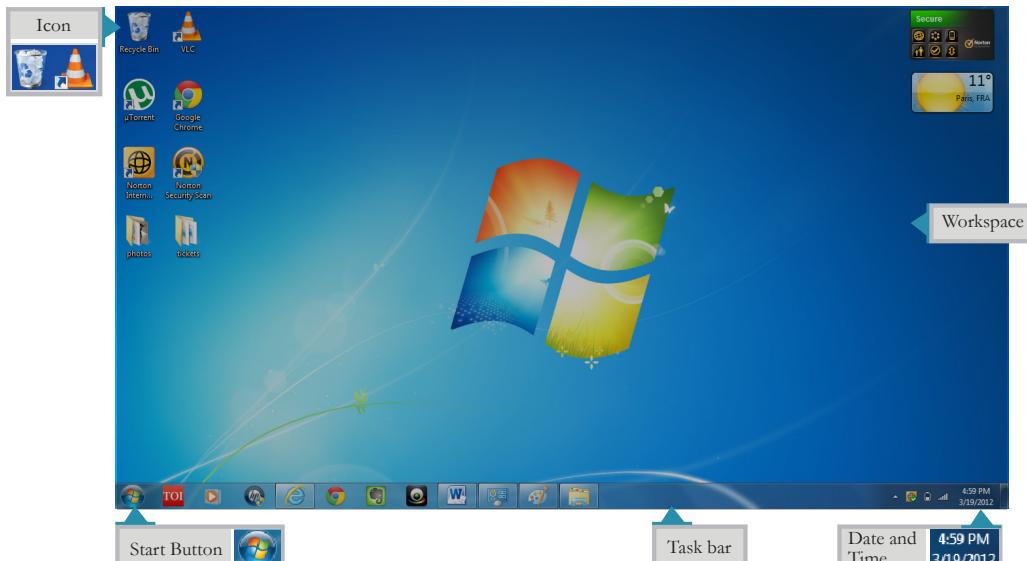


Fig.2 Window desktop

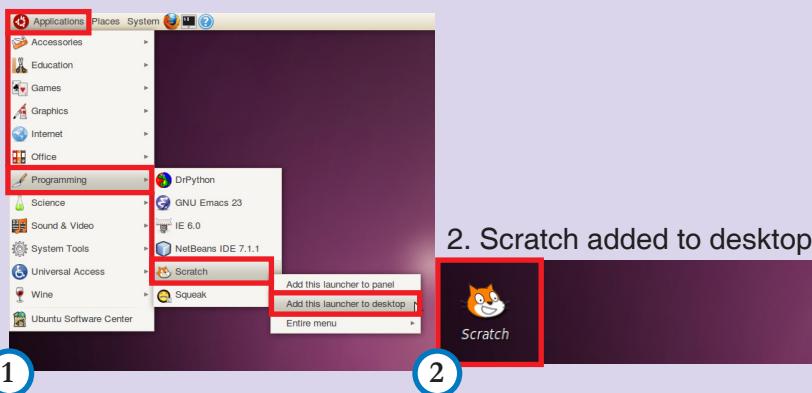
Launching applications from a panel or workspace

Jyoti: Applications can be launched from the application menu, or from the panel, or from the desktop workspace. We can create a desktop shortcut icon for an application that is accessed frequently.

Skill

Adding application launcher to desktop

- Select Applications → Programming → Scratch, right click and select → Add this launcher to desktop.



We can also add a shortcut to the application launch panel.

Skill

Adding application launcher to panel

- Applications Programming → Scratch now right → click go to → Add this launcher to panel.

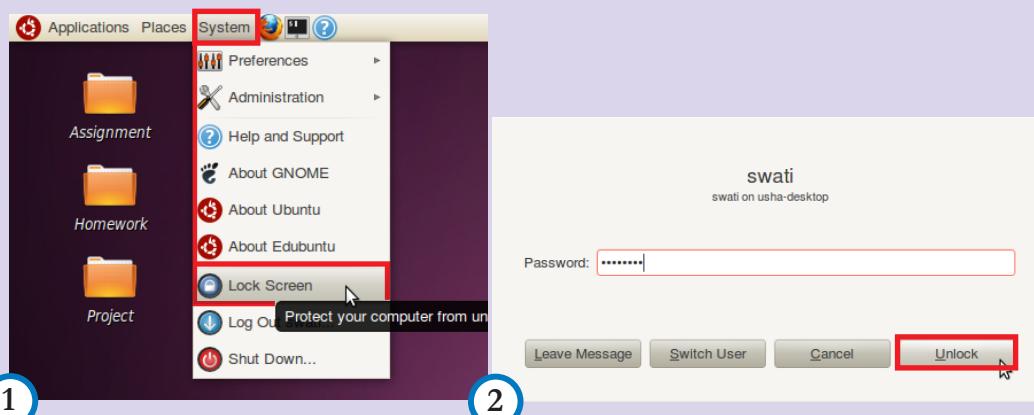


Tejas: Many a time we leave our computer for a short break. Instead of logging out we can lock the screen and then unlock it later, by just giving our password.

Skill

Ubuntu: Locking screen

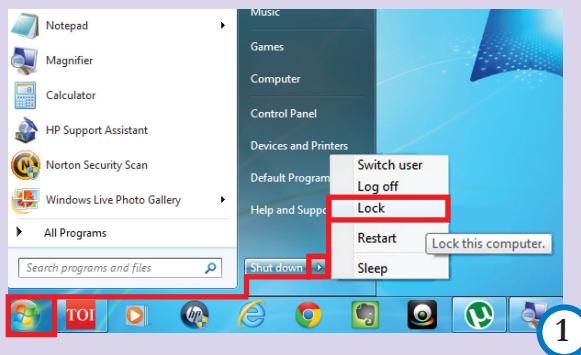
- Click on Main Menu → lock screen. • The screen is locked. To unlock enter password.



Skill

Windows: Lock Screen

- Click on Start Button → Shut down arrow → Lock.



- The screen is locked. To unlock enter password.



Starting applications automatically when a user logs in

Tejas: Our teacher has asked us to configure the system such that a browser comes up as soon as a user logs in. We might find an option in systems menu.

Moz: An application that is added in "startup applications" option, executes or starts automatically without the user intervention, as soon as the user logs in to.

Jyoti: Let us add firefox to the startup applications. Select systems → preferences → startup applications

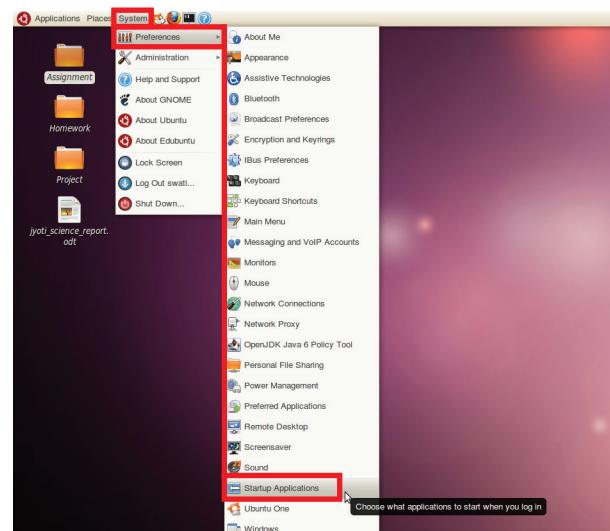
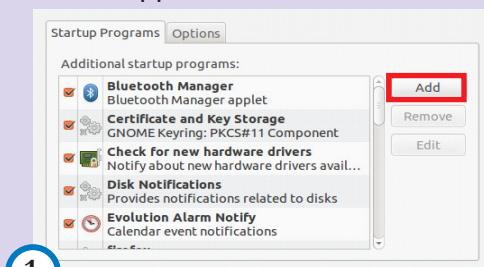


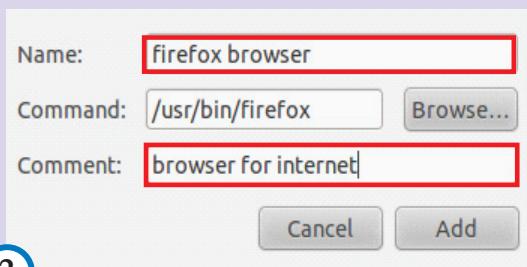
Fig.12

Adding an application to Startup applications

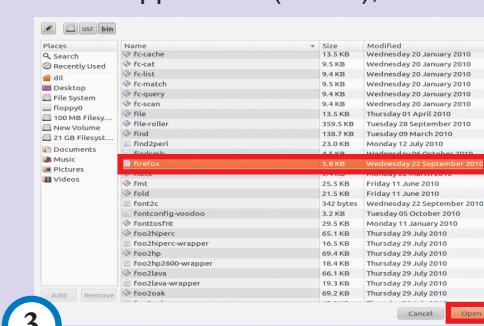
- Select application, click on add.



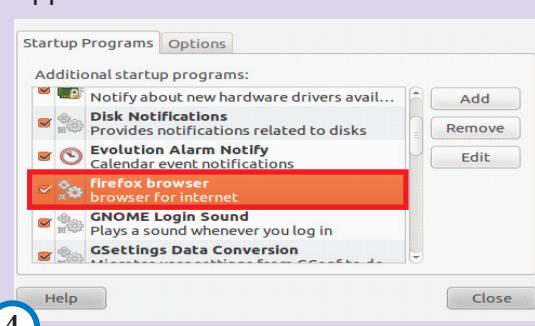
- Enter name, enter comment.



- Select application (firefox), click on add.



- Application added.



Concept

Software repository

A software repository is a storage location from which applications may be retrieved and installed on a computer.

Tejas: How do we start using the downloaded software?

Moz: Where should you check for details of the settings and usage of any application?

Tejas: “Help” option of any application gives us most of the information that we require for configuring an application and its usage details.

Moz: Good observation. First, you should follow the AWARE rules while downloading any application. Second, you have to download an installation file for the OS on your computer. Then you simply follow the instructions for installing the application.  wizard

For ubuntu, download .deb package which is used by Ubuntu Software Center (USC) to install software.

For windows, mostly .zip or .exe versions are available.

Guidelines

Application installation

- Download the package for your particular OS and it's version.
- Ensure that the repository is a reliable site before downloading and installing an application.
- Window OS install virus protection on your system and scan the downloaded package before installing it.
- Provide the path of the downloaded and extracted files .dir to the installer.
- Update yourself about the latest developments in the OS that is being used and details of software that you are using.

Privileges – System administrator and User

Moz: How many types of users are there on a computer?

Jyoti: A person can be either a **normal user** or a **System administrator**. These roles have different privileges.

Tejas: Does privileges mean the actions that the user is allowed to do on a computer?

Moz: Right. A **privilege** is a set of permissions to perform some actions on the computer. These are configured by the special user, called the system administrator, who has all the permissions for performing all the actions on the computer.

Concept

Privilege

A privilege is a permission to perform an action. Examples of various privileges include the ability to create a file in a directory, or to read or delete a file, access and use devices like printer and, scanner.

System Administrator privileges

Tejas: Users cannot install new applications. Only a System Administrator can install the applications.

Moz: Right. This is to keep your system secure. What would happen if every user had system administrator privileges?



Recall

- A wizard is a user interface that presents a user with a sequence of dialog boxes that lead the user through a series of well-defined steps. Tasks that are unfamiliar, complex can be easily performed using a wizard.

Tejas: A user who does not need an application might remove the application. But this application may be required by another user.

Tejas: If a user deletes some system file inadvertently, then the system may crash. Some applications may not run.

Jyoti: If users keep changing system and network settings, we may not be able to access the system or the network.

Moz: Right. You should have good knowledge of the system and application settings, and configurations, before you start experimenting with them. To keep the system in a consistent and secure state for all the users, it is always a good idea to work as a user even if you own the system. Only when you want to perform some system administrator tasks, for example changing network settings or for installation of applications, you should login as a system administrator.

User Privileges

Moz: Now let us look at the normal user privileges.

Tejas: The user needs to first have a login and password to access the computer.  authentication

When a user logs in to the computer, the user can open applications, create and delete files and directories. The user can also organize the desktop.

Jyoti: A user can also use devices like printer, scanner, digicam, speakers and pendrive.

Moz: The user also has privileges to set configurations of some devices and applications. Start exploring some of these.

Tejas: A user needs to set sound as per his/her preference of the volume. Let us see if we can change these. (See Fig.6)

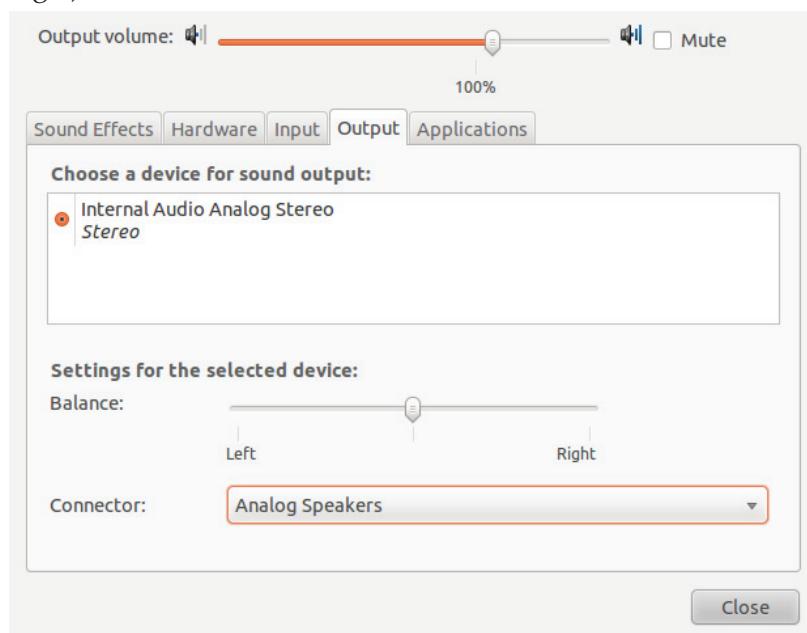


Fig.6 Sound settings

Jyoti: Yes, we can change the settings. It is also a good idea to put this on the top panel so that we can easily access it. Many a time we need to change the sound volume and may also set it to 'mute'.  mute (So that we do not disturb others.) Other option is to use headphones by checking the input settings.

Tejas: From the preferences menu (**system → preferences → monitor**) using the option "Monitor", Monitor resolution (see Fig.7) can be changed, and with printer option (see Fig.8) the size of the paper that we are using to print, can be set.

Moz: You are right. Explore the other options to see what else can be configured by a user.

Recall

- Authentication in computers is the process of identifying a user, usually based on a username and password. Currently biometrics are also being used for authentication.
- Mute turns off the volume when it is pressed. The audio continues to play, but you cannot hear it. Pressing Mute again will turn the volume back on.

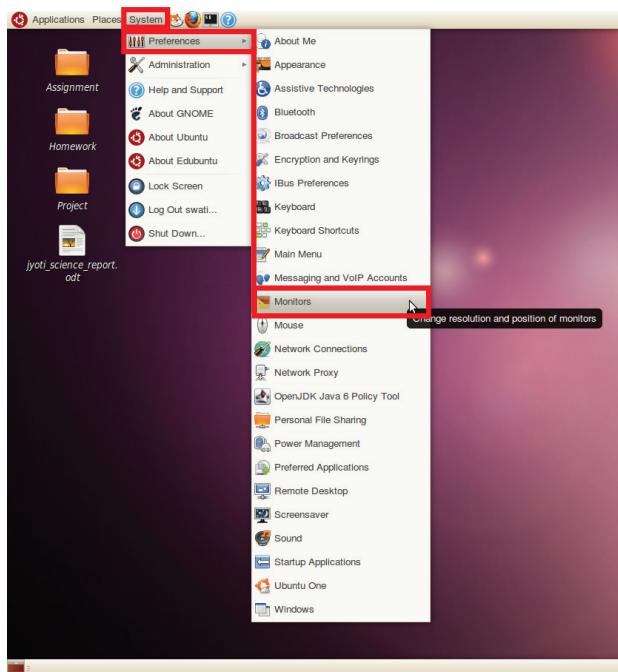


Fig.7 Monitor resolution

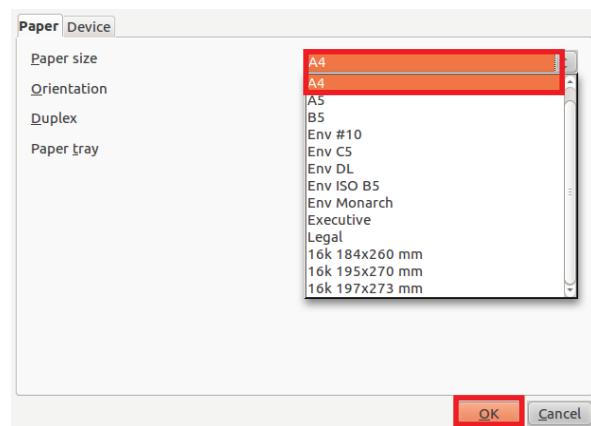


Fig.8 Printer settings

Users privileges

- A normal user of a system has privileges to use his/her workspace as per his/her requirements.
- Some configurations like sound volume and printer setting options can be set by a user for his/her usage. These settings made by a user are recorded for the user by the system. These settings are enabled for that user for his/her subsequent logins also.
- A user can view the current network settings, the installed software, and the software that is available for installation.
- Some of the basic settings that a user can perform are:
 - Change resolution of a ‘monitor’.
 - Change ‘printer settings’.
 - Add applications to ‘startup applications’.
 - Change ‘screen saver’.
 - Change the ‘appearance’ of the desktop.
- Some actions that a normal user cannot perform are:
 - Configuring network settings.
 - Adding users.
 - Changing OS settings and configurations.
 - Installing OS software.

System Administrator privileges

- A limited number of users have System administrator privileges.
- System administrator privileges allow a user to control and configure the system.
- Some of the basic tasks that a system administrator does are, installation of software and hardware, configuring network settings, adding users and trouble shooting.
(See Fig.9)

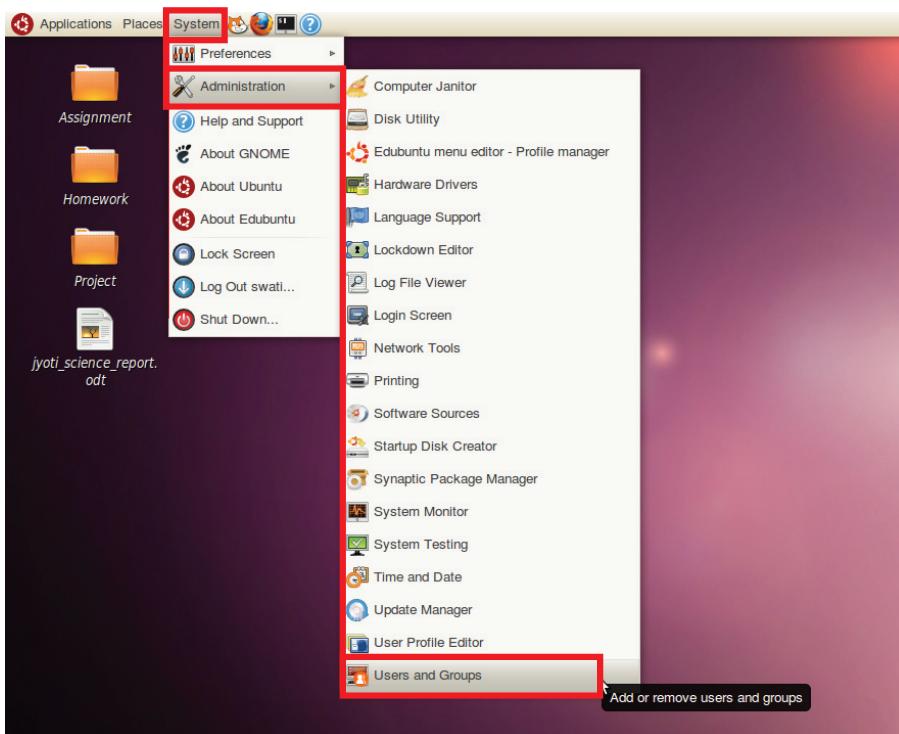


Fig.9 Adding users

Sharing and protecting files

Tejas: How do we share some of the files with all the users?

Moz: 'Right-click' on a file and check its properties. An interface to set the properties of a file or directory is available on all OS, like Ubuntu, Windows and Mac OS. Explore these for Ubuntu.

Jyoti: There are many options. The 'Basic' tab gives many details of the file, like type of file, size of file in bytes, the in which directory it is located, and when it was accessed and modified. (see Fig. 23). Right click on file. Following details with options are displayed.

Skill

Ubuntu: Setting permissions on a file

Basic Emblems Permissions Open With Notes Image

| | |
|-----------|-------------------------------------|
| | Name: IMG_0149.JPG |
| Type: | JPEG image (image/jpeg) |
| Size: | 177.9 KB (182139 bytes) |
| Location: | /home/dil/Desktop/brahmakamal... |
| Volume: | unknown |
| Accessed: | Sunday 03 July 2011 06:18:30 PM IST |
| Modified: | Monday 27 June 2011 06:25:15 PM IST |

Basic Emblems **Permissions** Open With Notes Image

| | |
|------------------|--|
| Owner: | dil |
| Access: | Read and write |
| Group: | dil |
| Access: | Read-only |
| Others | None |
| Access: | Read-only |
| Execute: | <input type="checkbox"/> Allow executing file as program |
| SELinux context: | unknown |
| Last changed: | unknown |

Tejas: Now let us check what permissions mean.

Concept

Permissions

Permissions specify how a file or directory is accessed and the actions that can be performed on the file by users on the computer.

The access permissions that can be set are:

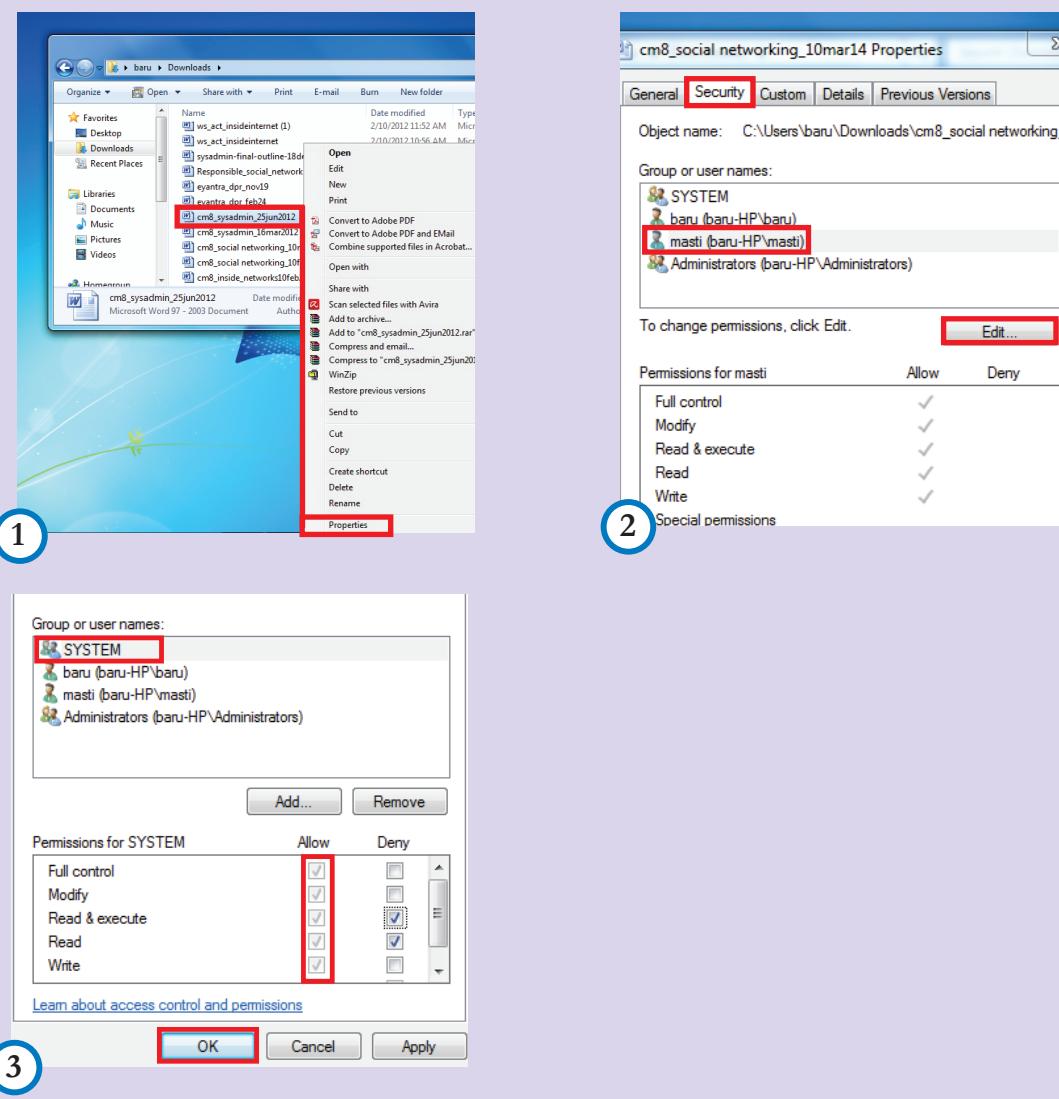
- Read-only – Users can only view the contents but not modify.
- Read and Write – Users can read and modify the contents.

Other action options are:

- Execute: The file is allowed to be executed like a program.
- Open-with: Open the file with the application specified, example: firefox browser or adobe reader.

Skill

Windows: Setting permissions on a file



Tejas: A user can share a file that he/she owns with other users or a group of users or all users.

Jyoti: The permissions on a file for access by the other users or groups can be explicitly set by the owner or system administrator.

Moz: Using the properties interface of a file or directory, a user provides permissions on the file like read, write, execute, and also specifies which other user can access this file.

Tejas: We can also choose an application using which the file can be opened.

Info

Sharing a file and folder

Following are the file access permissions for each of the owner, the group, and all other users:

- None – Users other than the owner cannot access the file at all.
- Read only – Users can open the file to see its contents, but cannot make any changes.
- Read and Write – Users can open the file, modify its contents and save it.

Other actions on the file:

Execute: Allow the file to be run as a program. Example: Application file like open office, games.

Open – with: Choose an application with which the file can be opened.

Following are the folder access permissions for each of the owner, the group, and all other users:

- None – No access to the folder is possible, for users other than the owner.
- List files only –The users can see the items in the folder, but not open any of them.
- Access files – Users can access items in the folder, (either read-only or read-write), depending on the permissions of each item.
- Create and delete files – The user can create new files and delete files in the folder, in addition to being able to access existing files.

Backup of files

Tejas: One other important step for users is to backup their work.

Moz: Why is backup important?

Tejas: Suppose we were not able to complete some work at school, we can use the backup and work from home or from some other place where we can get a computer.

Jyoti: When a system crashes (the system does not start when it is powered on), or the computer is affected by virus, or a hard drive failure, all our work is not lost. We can use the backup and work from another computer.

Tejas: We can retrieve a file from backup, if the file is overwritten accidentally.

Jyoti: I have a backup of my assignments from Computer Masti, in previous standards. These have been deleted from the lab desktops to create space for other students.

Moz: Very good points about the importance of backups.

Concept

Backup

- Making a copy of content like documents, mails, programs, projects, created on the computer is called backup.
- Backups are important to all the users of a computer.
- The data and documents that are created on a computer are not completely lost in any eventuality like deletion of files from systems, system crash, disk crash, or an unforeseen accident to the computer.
- Backups can be taken on any external device like pendrive, CD, or on an internet storage server. You can also email yourself a copy of the file for backup.
- Backing up on an external device and keeping it in another location than the computer that it has been created on, is recommended.

User level backup vs System level backup

A user level backup is usually done on pen-drive, or, internet storage server.

- Users level backup can be done by users for:
 - The documents and content that they create on a computer.
 - Important emails.

A system level backup is usually done on external hard-disks, or duplicated on another server (Also called a “Mirror site”).

- A system level backup is done by the system administrator for:
 - user information and directories.
 - configuration of the system.
 - configuration of applications.
 - databases (for example, a database of students, a database of train schedules which are stored in special files).

External device - Plug and Play

Tejas: We need to show how to access an external device when it is connected to the computer. Let us connect a pen drive (See plug and play skill boxes that follows).

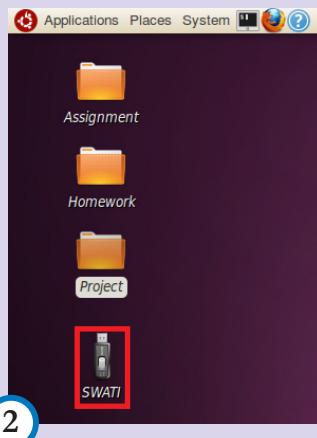
Ubuntu: Plug and play

- Connect electrical device to computer (Pendrive).



1

- An icon representing the device appears on desktop.



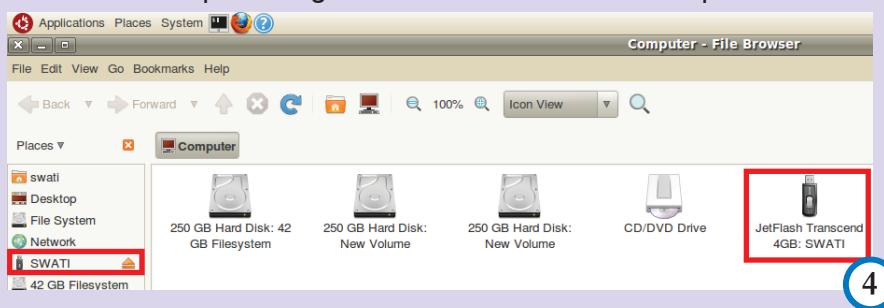
2

- External device name appears in places.



3

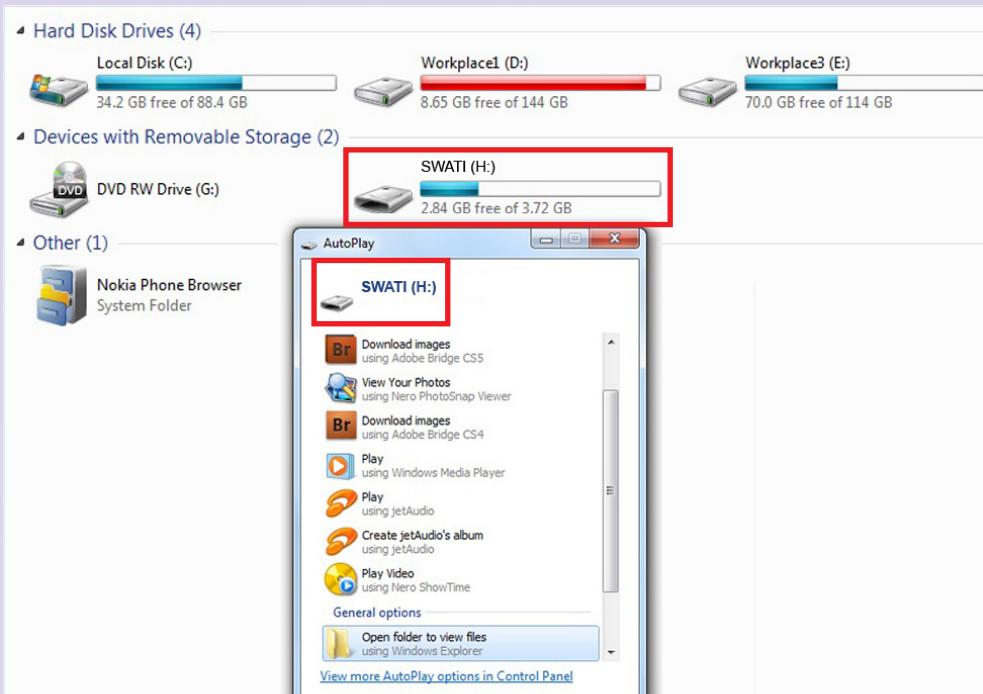
- Click on computer to get a list of all devices on computer.



4

Skill

Windows: Plug and play



Jyoti: The pen drive is just like any other folder. We can navigate through the pen drive and find the files and directories in it.

Tejas: When we use the “Save As” option in any application, we can select the pen drive and save the file directly on it.

Jyoti: We can do operations like copy-paste of files and folders to the pen drive.

Moz: Right. Such devices are called “Plug and Play” devices. You plug in the device to the computer and can almost immediately start ‘playing’ or using it, without having to restart the computer.

Concept

Plug and Play

The ability of a computer to automatically configure and make a newly connected device available to the user, is called plug and play. For example a pendrive is connected through USB to the computer. Almost immediately the user can read content from the pen drive and write to it.

Troubleshooting Devices

Jyoti: Now let us explore troubleshooting of some basic problems in the lab.

Tejas: First, suppose a system does not start. What should we check before reporting to the system administrator?

Jyoti: Let us list down some steps for each type of problem.

System startup

1. Check that the power cable is connected and the power switch is on.
2. Check that the computer is switched on.
3. If there are any error messages on the screen report to the system administrator.

Network connectivity

1. For wired network, check if the network cable is connected and the indicator LED is blinking.
2. For wireless network, check if the wireless is ON. Also check if the wireless switch in the vicinity is working.
3. Check if network has been enabled.
4. Inform the system administrator if there are any network error messages.

Devices

1. Check for loose connections.
2. Check configuration and settings (whichever is relevant to that particular device).
 - Example: Sound → check if mute is on.
 - Printer → power, printer cable attached paper in tray.

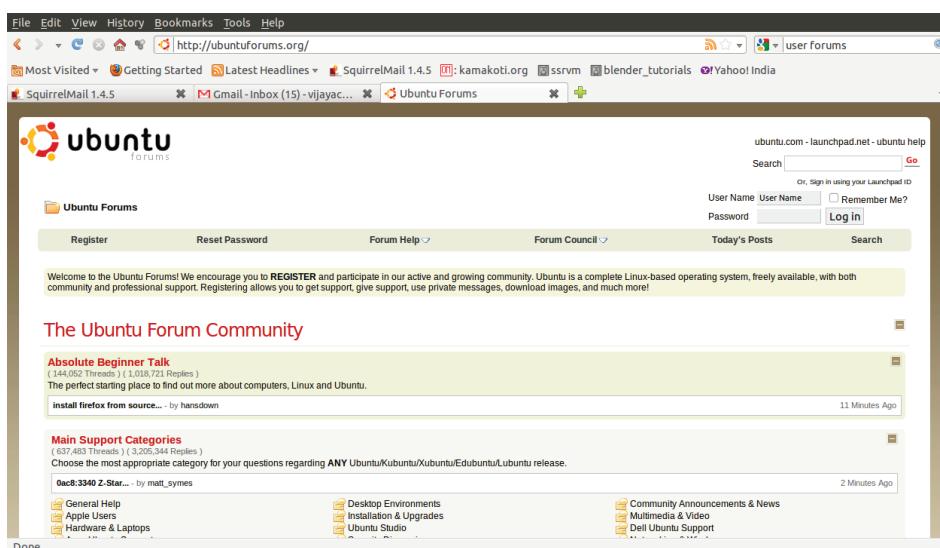
Application startup

1. Check if the application is installed on the computer.
2. Check if the user has permission to use the software. Ask the administrator to change permissions and also the configurations, if necessary.

Troubleshooting applications

Tejas: Sometimes the System administrator says that the installation does not go ahead smoothly and some trouble shooting needs to be done.

Moz: Yes. Usually the downloaded application has documents with instructions and tutorials. The other important resource is the 'User forum' of that particular application. Here you can find a lot of information about installation, configuration and trouble shooting. You can post your problem and often some user will post a solution. (See Fig.10)



—●Fig.10 Ubuntu forum ●—

User forums

- User forums are websites where users can post a message or comment on a message that is already posted. Sometimes users may have to register to post and comment on the forum.
- In some of the forums like wikipedia, the posted message or comment, might need to be approved by a moderator before it becomes visible to all.
- User forums of both hardware and software usually have tutorials, beginner's guides, discussions of problems, trouble shooting tips and solutions.

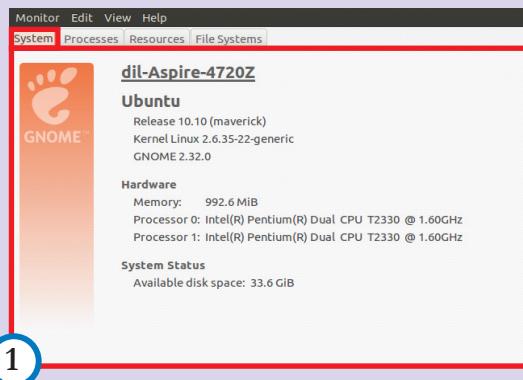
Monitoring system and processes

Jyoti: Sometimes an application stops responding while we are working with it.

Moz: Look at the “System monitor” from the system administration menu which gives details of process.

Checking the status of process

- Click System → System monitor → System details are displayed.



- Click on processor. Processor details are displayed.

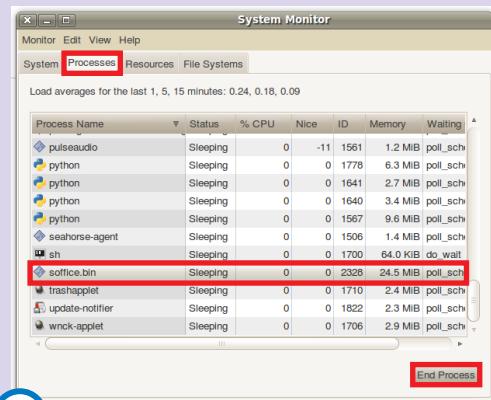
| Process Name | Status | % CPU | Nice | ID | Memory | Waiting |
|-----------------------------|----------------|----------|----------|--------------|----------------|------------|
| gnome-panel | Sleeping | 0 | 0 | 9415 | 6.4 MiB | poll_sched |
| gnome-power-manager | Sleeping | 0 | 0 | 9377 | 1.4 MiB | poll_sched |
| gnome-pty-helper | Sleeping | 0 | 0 | 10464 | 704.0 KIB | unix_strea |
| gnome-screensaver | Sleeping | 0 | 0 | 9498 | 1.4 MiB | poll_sched |
| gnome-screenshot | Sleeping | 0 | 0 | 10485 | 2.7 MiB | poll_sched |
| gnome-session | Sleeping | 0 | 0 | 9334 | 1.3 MiB | poll_sched |
| gnome-settings-daemon | Sleeping | 0 | 0 | 9379 | 3.2 MiB | poll_sched |
| gnome-system-monitor | Running | 6 | 0 | 10445 | 5.1 MiB | 0 |
| gnome-terminal | Sleeping | 0 | 0 | 10461 | 3.2 MiB | poll_sched |
| GoogleTalkPlugin | Sleeping | 0 | 0 | 9645 | 8.2 MiB | poll_sched |
| gtk-window-decorator | Sleeping | 0 | 0 | 9504 | 4.1 MiB | poll_sched |
| gvfs-afc-volume-monitor | Sleeping | 0 | 0 | 9494 | 396.0 KIB | poll_sched |

Jyoti: Oh! We must end the application that is not responding.

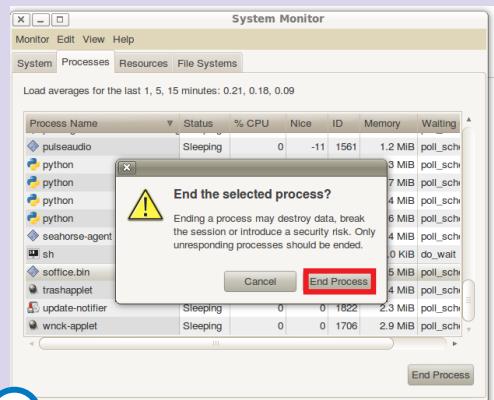
Tejas: Let us end the openoffice application that we started.

Ending a process that is not responding

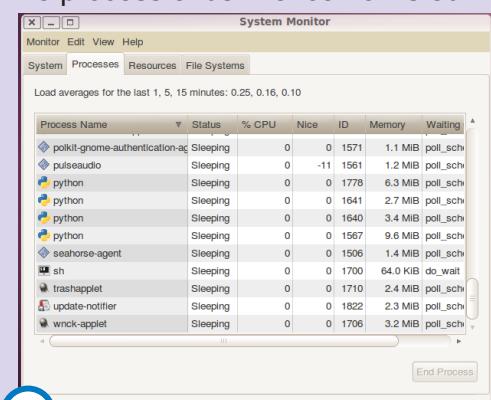
- Select process to end.



- Click on end process.



- The process ends. Hence not listed.



Tejas: There are some processes running and some processes sleeping. What does this mean?

Moz: By default many processes are started by the computer. These will be sleeping till you start using them. A user can end any process that is started by him/her.

Moz: Now look at the resources. (See Fig.11)

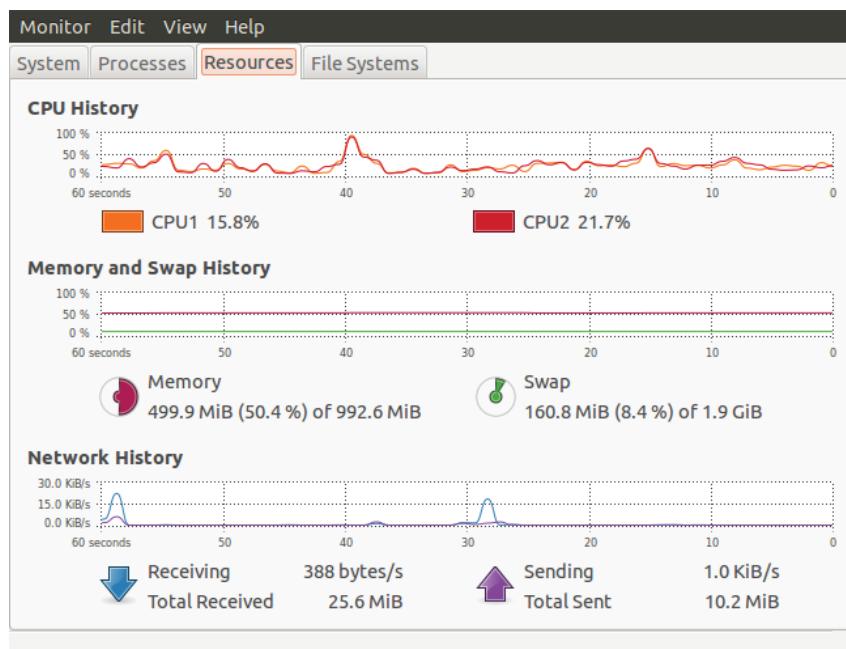
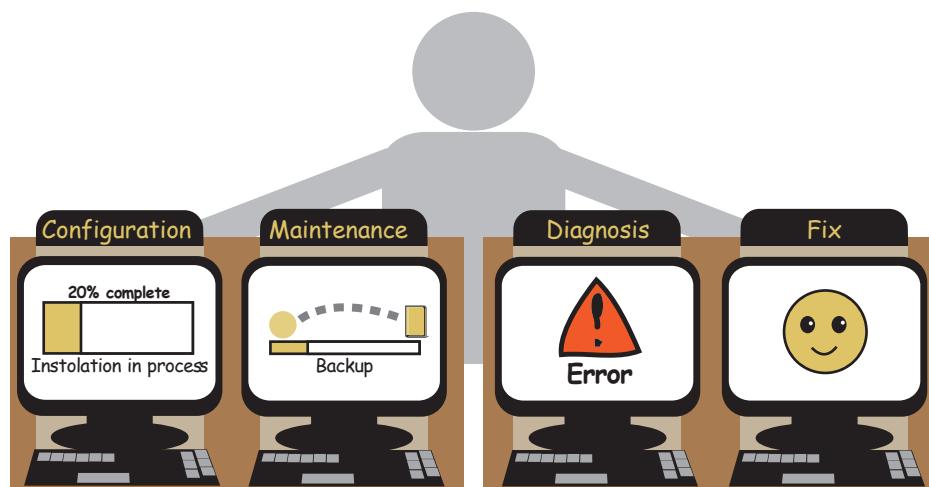


Fig.11

Tejas: This is very interesting. It shows details of CPU, Memory and Network usage.

Jyoti: We are now ready to assist our teacher.

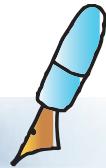
Moz: While you are assisting, keep observing and analysing situations, to improve your system administration skills. All the best. Chin Chinaki...



At the end of this lesson, you will be able to:

- Identify the basic components of a desktop.
- Install an application.
- Distinguish between user and system administrator privileges and backup.
- Set permissions to share files and folders.
- Perform basic trouble shooting for devices and applications.

WORKSHEETS



1. Answer the following:

a. A computer user from class VIII, who is familiar with Ubuntu desktop, is checking out various desktops that are available in the computer store. Each computer has a desktop with different look and feel. The user is able to navigate through all the desktops. How is this possible?

b. A user finished working on the computer in the lab. What should the user do so that the user's work is safe and others can use the computer?

c. A user has to leave the computer briefly. The user does not want to logout. What should the user do?

d. Jyoti has setup an account on the computer for her grandma.

i. She wants to create a directory on the desktop to store her grandma's favourite music. What is the component of the desktop where the directory can be created so that grandma can locate it easily?

ii. She wants to create a shortcut for openoffice. Which are the three components of the desktop where you can create a shortcut for the application?

iii. She wants to start some applications like firefox and music player automatically, when her grandma logs in. Where should a user setup the application that has to be launched automatically, when the user logs in?

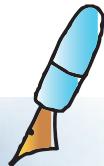
e. Tejas wants to install scribus on a computer that has Windows XP.

i. Which of the following should he select for download? Tick the correct answer.

- Windows(32-bit)
- Scribus Portable (PortableApps.com Format)
- Mac OS X DMG (Intel only, Leopard (10.5) or higher)
- Os/2/eCom Station

ii. After downloading what should Tejas do before installing?

WORKSHEETS



2. Answer the following.

i. Sourceforge.net has software that can be downloaded. What is the storage location, where the software is stored for download, called?

ii. What are the permissions to perform actions like, creating a file in a directory, or to read or delete a file, access and use devices like printer, scanner called?

iii. Which type of a user can change the network settings on a computer?

iv. Ravan can create, read and write files only in the directory assigned to him. What type of a user is he on the desktop?

i. Users on a computer lost their project files on a system due to system crash, but are not worried. Why? How will the users submit the project to the teacher?

3. Answer the following.

Are you a Ubuntu user or Windows. Write the OS for which you are answering each question:

a. Savani wants to install educational software on an ubuntu system. Which application can she use to install the software?

b. Can software from any source on internet be installed?

c. If yes, What are the precautions and checks that should be taken before installing the software from internet?

d. Give the steps of getting software from the internet and installing with an example.

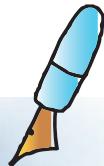
WORKSHEETS

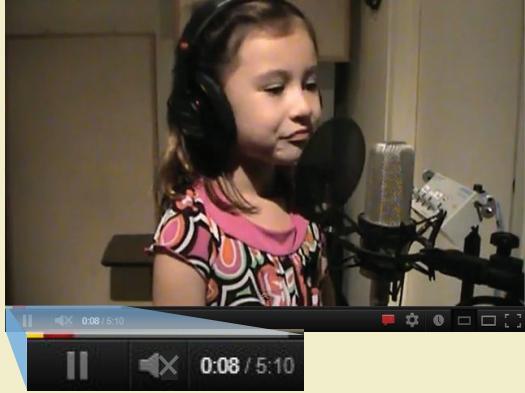


4. Answer the following trouble shooting problems for a particular situation shown in the second column. List two more such situations that could cause the problem.

| Problem | Screenshot/illustration/photograph of one situation where the problem occurs | Identify the problem for the situation in the previous column. | List two more situations that could cause the problem. |
|-------------------------|--|--|--|
| a. System not working | | | |
| b. Printer not printing | | | |
| c. Network disconnected | | | |

WORKSHEETS



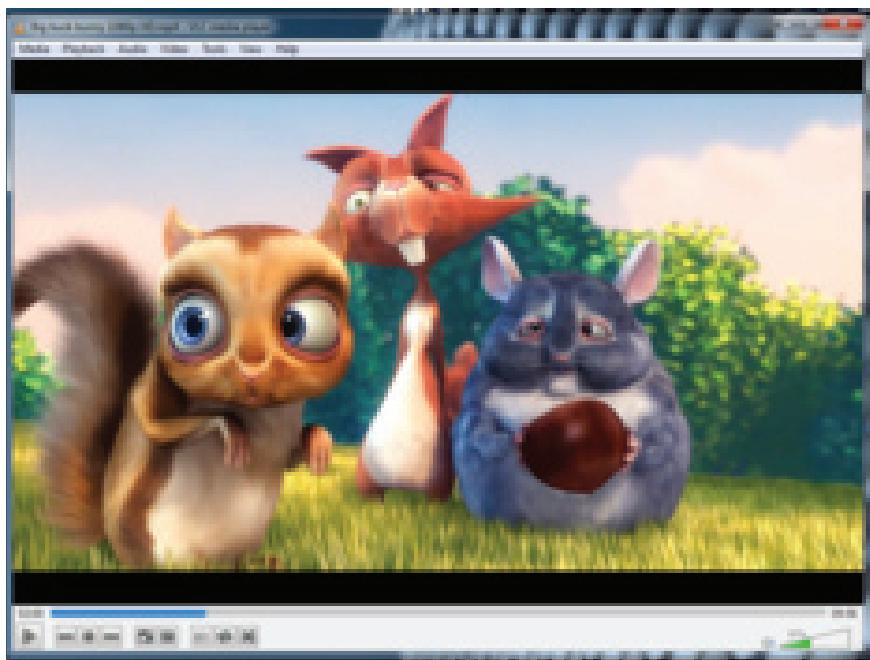
| Problem | Screenshot/illustration/photograph of one situation where the problem occurs | Identify the problem for the situation in the previous column. | List two more situations that could cause the problem. |
|---|---|--|--|
| d. Cannot hear the sound when video is playing. |  | | |
| e. Not finding an application. |  | | |



ACTIVITY

Level VIII | Lesson 7

- 1. Customize the desktop for a novice user on a computer. The user login id is “bond099”.**
 - a. Create a directory for the user to save files.
 - b. Make the calculator or the clock application easily available for the user.
 - c. Launch the word processor application when the user logs in.
 - d. Create a Readme file for the user on the desktop. In the file give information to the user about
 - The directory where the user can save the file,
 - The locations from where the user can start the paint application,
 - About using the “lock screen” application.
- 2. Divide the class into 4 to 5 groups. Each group member does the following:**
 - a. Create a dir called Secrets_of_the_group (Use your groupname for group). Provide read and write permissions to your group members.
 - b. Create another dir called my_stories and provide read permissions to all your classmates.
- 3. Divide the class into several groups of students so that each group gets a chance to install a new software on a computer.**
 - a. Download the latest VLC player from the internet. (The systemadmin can provide this file to all the groups).
 - b. Find out what are the new features by watching the slideshow on the website.



- c. Experiment with all the features on your computer.
- d. Plan a demo for junior students. Provide your step by step plan with the explanation that you will give for each feature.



PROJECT

Level VIII | Lesson 7

1. Buying and setting up a computer at home.

Your family has decided to buy a new desktop. Now that you are the computer expert at home, you have been assigned the following work:

- Draw a comparison chart for the prices of computers of various brands based on the processor, hard disk space, screen size, Drives available (DVD....)
(After the family's decision making, the new computer arrives at home).
- Create user accounts for your parents, brother and sister.
- Assign appropriate privileges² to the users.
- Create their personal folders, a common family folder and make short cuts on the desktop.
- Install Open office, Google chrome, Skype, Adobe reader, Flash viewer, Antivirus software.
- Add the applications required by individual users to start automatically when they login.
- Create a brief trouble shooting poster and keep it next to the PC.
- Create a video tutorial for the above.



Explore

1. Find out the similarities and differences in troubleshooting for various devices – cellphone, tablet and computer.
2. How can we restore all the settings, in case if we make a mistake during configuration.
3. What are drivers of a hardware and what are its functions?

- The objective of this lesson is to teach students elementary trouble shooting skills that would be required by a proficient user of computers. The lesson takes the students through two operating systems (OS) – Windows and Ubuntu. It is likely that students have already been exposed to multiple OS. You can discuss the difference in the look and varied options.
- Give a demonstration of an operating system to take the students through basic components of a desktop space. Refer the lesson for this and explain what is workspace and application launch panel. Refer the images used in the lesson for this.
- Students know about usernames and password. Ask them questions to revise the need of having these, particularly if a system is shared with multiple users or if you are working on important documents. Tell them how they can lock a system if they are away for a short while.
- Give a demonstration of how to add launchers to desktop. Select any application that the students are familiar with, such as word processor or Scratch. Emphasize that there are multiple ways of doing a single thing in each OS.
- Tell the students how a system administrator installs the applications they use. Give a demo of installing an application and setting up a startup application. If possible, show them how this can be done on alternate operating systems so that students feel confident about using either of these.
- Emphasize the importance of following guidelines while installing applications. Tell them that a system administrator holds important responsibility and grants privileges to users as per what their work requires. For instance, students may not be allowed to delete an application, a teacher may be allowed access to exercise control to restrict browsing to particular websites.
- Tell the students that similar restrictions may be exercised on particular files as well. Students have already learnt about these in context of content sharing and working on google docs. You can recall that knowledge.
- Give a demo of how one can share a file or folder on the system or across a network. Inform that the mechanism of doing these may vary across OS, but each one allows them to perform all of these functions. Ask students to work on worksheet question 2.
- Students are already aware of the concept of backup and varied mechanisms of taking backup. Revise this knowledge by asking relevant questions. You can inform the students that the mode of taking backup keeps varying with new and convenient ways, such as pen drive or hard disk. You can discuss the case presented in worksheet question 2 and write an answer for this.
- Talk to students about how particular hardware may need trouble shooting, and what may be done at an elementary level to deal with this. For instance, if sound is not heard or internet cable needs to be plugged and so on. Refer the section on trouble shooting devices. You may show them a video clip (example ted video or YouTube) on how to fix some of these. This will educate students on how there are handy resources, available over Internet to help them.
- Tell the students about how particular applications need trouble shooting at times. Talk to them about online community that provides advice on how to deal with these. Give a demo on Ubuntu community and how to follow these or post a query to solicit help if stuck with a particular problem.
- Teach students how performance of a system can be monitored. Students already know about RAM/ROM, network connectivity and speed. Give them a demo of how one can check on each of these. Ask students to do worksheet question 4 at this time.
- Summarize the lesson and emphasize responsible use of a system. You can invite a system administrator to give a talk on what are the various activities they typically perform to maintain the school computer lab. It will allow students to appreciate their job.

Further Reading:

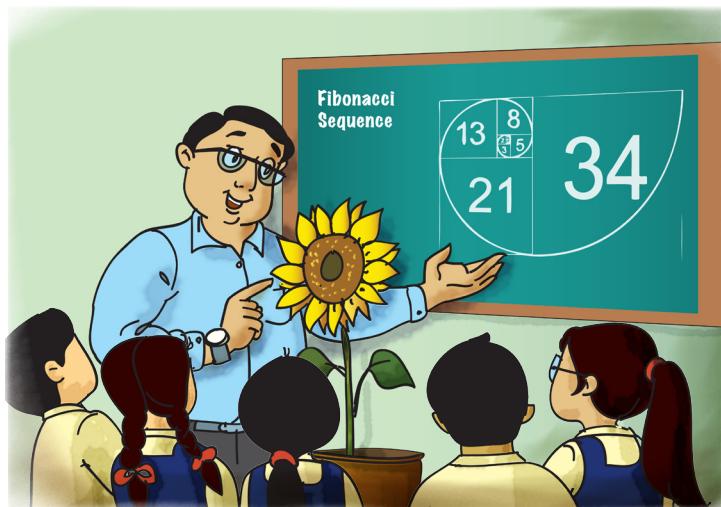
<http://tldp.org/LDP/sag/html/index.html>
http://www.networktutorials.info/computer_tips_tricks.html
<http://www.mozilla.org/en-US/firefox/customize/>

```
while b < num
    34
    0, 1, 1, 2, 3,
    5, 8, 13, 21,
    34, ...
```

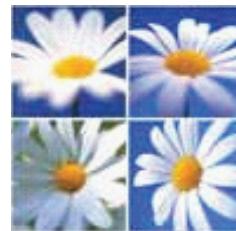
BASIC

Aim: In this lesson, you will learn:

- Repetition of statements with condition.
- Defining and executing subroutines.
- String functions.



Tejas: In our Science class we discovered that the number of petals on flowers is mostly one of the numbers in a sequence called the **Fibonacci sequence**.



13 petals



5 petals

Moz: What are Fibonacci numbers and how do you get the sequence of Fibonacci numbers?

Jyoti: In mathematics, the Fibonacci numbers are the numbers in the following integer sequence:
0, 1, 1, 2, 3, 5, 8, 13, 21..... and so on.

Tejas: The first two numbers in the Fibonacci sequence are 0 and 1. Each subsequent number is the sum of the previous two numbers. For example, the next number in the sequence shown above is $13 + 21 = 34$.

Jyoti: Let us write a program to generate the Fibonacci sequence of numbers, upto 1000.

Tejas: Let us first write the algorithm for generating the sequence, by trying out an example.

Examples

Sequence Generation

$$1 + 1 = 2$$

$$1 + 2 = 3$$

$$2 + 3 = 5$$

$$3 + 5 = 8$$

$$5 + 8 = 13$$

1, 1, 2, 3, 5, 8, 13, 21,

Algorithm

1. (We need three variables)

Let a = previous number, b = current number, c = next sequence number.

2. Ask the user to input a number upto which fibonacci numbers should be generated.

3. Print the first two fibonacci numbers.

4. As long as $c < 1000$ repeat the following.

(Calculate next fibonacci number which is the sum of previous numbers and current numbers.)

Next fibonacci sequence number $c = a+b$.

If $c < 1000$ print the fibonacci numbers.

(The previous number and the current number shift, that is, they take the next values in the sequence.)

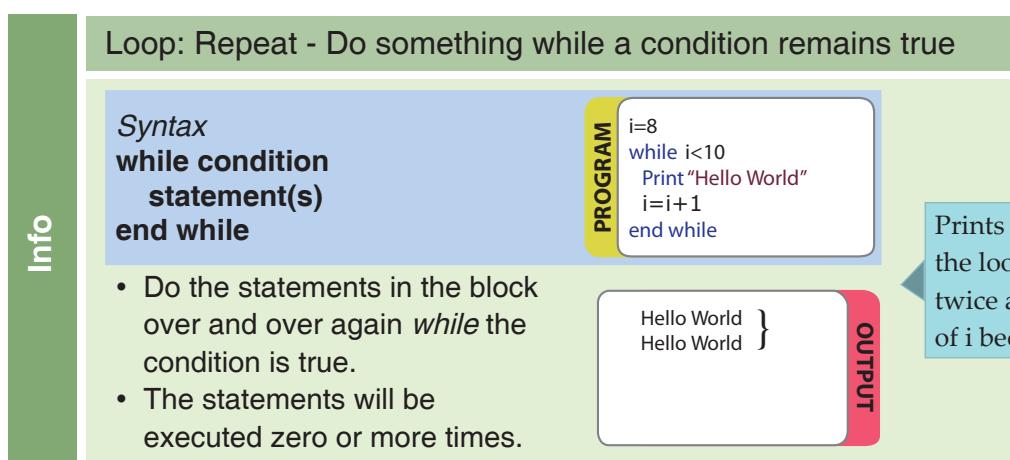
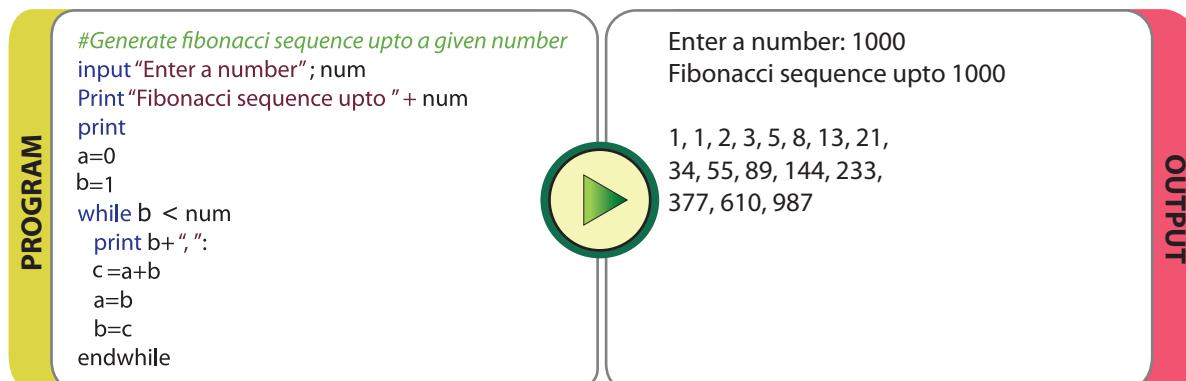
previous number $a = b$.

Current number $b = c$.

Tejas: The repeat statement “For”  For statement will not work here as we do not know the number of times that we need to repeat a set of statements. Let us see if we have other repeat statements that we can use.

Jyoti: We can use “While” statement.

Moz: Such repetitive statements such as for and while are called **Loops**.



Info

Loop: Repeat - Do something while a condition remains true

Syntax

```
while condition
    statement(s)
end while
```

- Do the statements in the block over and over again *while* the condition is true.
- The statements will be executed zero or more times.

PROGRAM

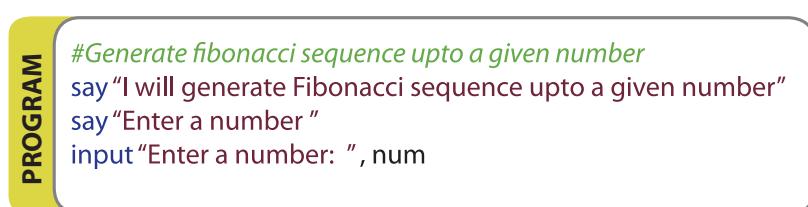
```
i=8
while i<10
    Print "Hello World"
    i=i+1
end while
```

OUTPUT

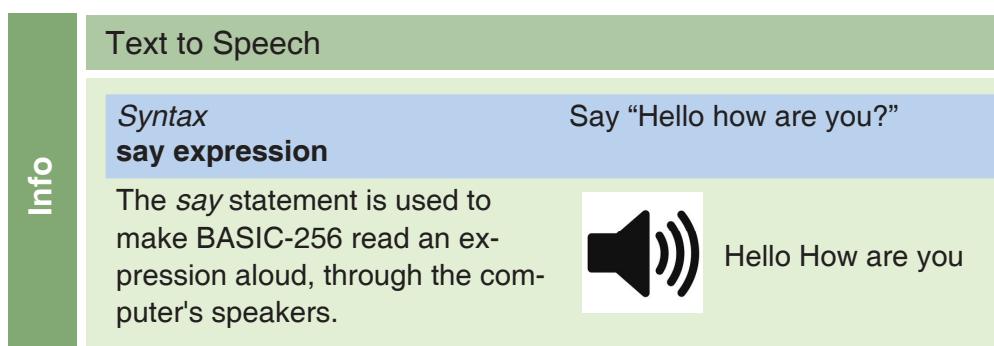
```
Hello World }
Hello World }
```

Prints twice because the loop is executed twice and then value of i becomes 10.

Jyoti: We can also convert text to speech. In the above program before the “input” statement we can put the following statement and the computer reads out the text.



Tejas: Wow! This is cool!



Info

Text to Speech

Syntax

```
say expression
```

Say “Hello how are you?”

The *say* statement is used to make BASIC-256 read an expression aloud, through the computer's speakers.

OUTPUT

 Hello How are you

Jyoti: Now I want to build a program for a simple calculator.

Tejas: Let us write the algorithm for the calculator.



Recall

- For statement executes a specified block of code a specified number of times, and keeps track of the value of the variable.

Algorithm

Algorithm for the calculator

1. Ask the user for the operation to be performed. (Addition, subtraction, multiplication, division).
2. Ask the user to enter two numbers num1, num2 for the operation.
3. Use a condition block to identify the operation selected by the user.
4. Write statements for performing each operation.
5. Print the result.

Moz: You can use a subroutine for each of the operations.

Tejas: What is a subroutine?

Moz: Sometimes we want to repeat a block of code multiple times. We use a loop (For and while statement) when we want to repeat the block, immediately. But, if we want to repeat the block of code at different times, then we use a subroutine. When we give a label to the block of code, it becomes a subroutine. Whenever you want to execute this block of statements, you just use the **gosub** statement. This is called a call to the **subroutine**.

Jyoti: Why should we use subroutines?

Moz: Subroutines help you to understand a program easily. Look at the following example. Explain what the program does?

PROGRAM

```
#rem A simple calculator
menu:
print "Enter your choice of mathematical operation"
print "1- Additon";
print "2- Subtraction";
print "3- Multiplication";
print "4- Division"
input ">", choice
input "Enter number1>", num1
input "Enter number2>", num2
if choice=1 then gosub addition
if choice=2 then gosub subtract
if choice=3 then gosub mult
if choice=4 then gosub divison
end

addition:
  result = num1 + num2
  Print num1 +"+" + num2 + "=" + result
return
# rem similar subroutines are written for subtract, mult, division
```

Jyoti: This is a simple calculator. Depending on the choice of the operation the program just calls the subroutine to do the calculation.

Jyoti: Can we call the subroutine any number of times.

Moz: Yes. You can.

Tejas: Understanding someone else's program will be easy if there are subroutines.

Moz: Additionally there should also be comments.  Comments

Jyoti: When we work in teams, we can divide a program into subroutines for each task, and subtasks. Each one of us can write a part of the code and also independently test it. Then we can combine the subroutines into the main program.

Moz: Right.

Recall

- Comment statements (Rem and #) help in understanding the flow of the program and debugging the program.

Subroutines

- A Subroutine is used to repeat a block of code at different places in a program.
- When a subroutine is called, the program execution which is also called the control flow of the program, moves into the subroutine. After the subroutine is executed, the control flow of the program comes back and continues from the next statement after the subroutine call.
- Advantages of using a subroutine:
 - Multiple calls to a block of code are possible, at different times in the program.
 - They reduce the chances of typing errors when the same code has to be used in multiple places in the program.
 - A program is easy to read, since the main steps can be easily followed.
 - Programs are easier to design, since the main steps are written. The subroutines contain the details of these steps. ① Stepwise thinking
 - When more than one programmer works on a program, each programmer can choose a subroutine to write independently and also test it. Then the subroutines can be called in the desired sequence.

Subroutines

Syntax (to define a subroutine)

label:

 statement(s)

return

Syntax (to call a subroutine)

gosub label

A subroutine has a *label* followed by a sequence of statements and ends with a *return* statement. You may have multiple subroutines in a single program.

- When a call is made to the subroutine using the gosub statement the program control is transferred to the subroutine.
- The gosub statement causes the execution to jump to the subroutine defined by the label.
- return statement of the subroutine sends control back to where the subroutine was called from.
- Next, execution of the statements following the gosub statement takes place.

#subroutine for addition

addition:

 result = num1 + num2

 Print num1 +"+"+ num2+"="+ result

 return

#rem A simple calculator

menu:

print "Enter your choice of mathematical operation"

print "1- Additon";

print "2- Subtraction";

print "3- Multiplication";

print "4- Division"

input ">", choice

input "Enter number1>", num1

input "Enter number2>", num2

if choice=1 then gosub addition

if choice=2 then gosub subtract

if choice=3 then gosub mult

if choice=4 then gosub divison

end

#subroutine for addition

addition:

 result = num1 + num2

 Print num1 +"+"+ num2+"="+ result

 return

#subroutine for subtraction

subtract:

 result = num1 + num2

 Print num1 +"-"+ num2+"="+ result

 return

#subroutine for multiplication

mult:

 result = num1 + num2

 Print num1 +"**"+ num2+"="+ result

 return

#subroutine for division

division:

 result = num1 + num2

 Print num1 +"//"+ num2+"="+ result

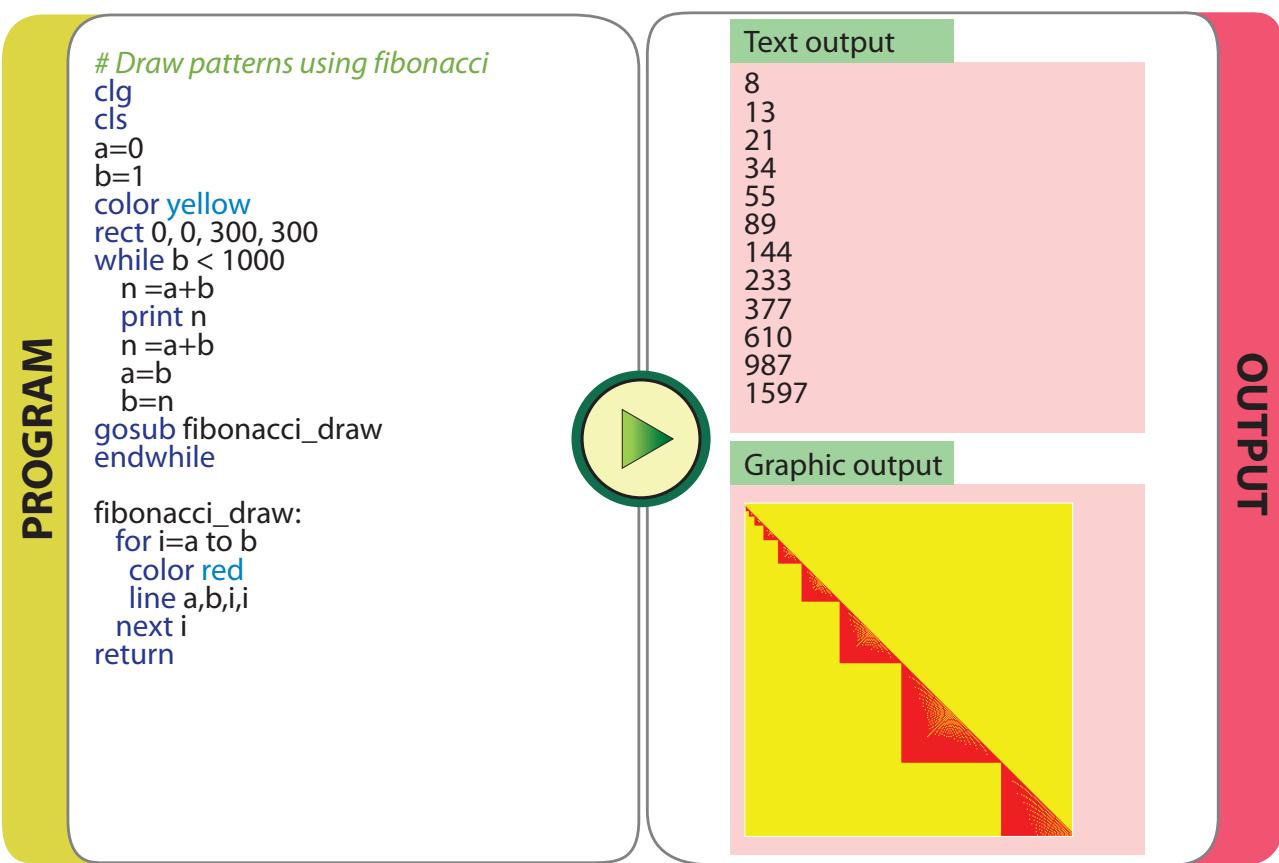
 return



Recall

- Apply stepwise thinking for planning a program. The main steps can be listed and the details of some of these steps can be included in the subroutines.

Jyoti: Let us use a subroutine to generate a graph using the fibonacci series.



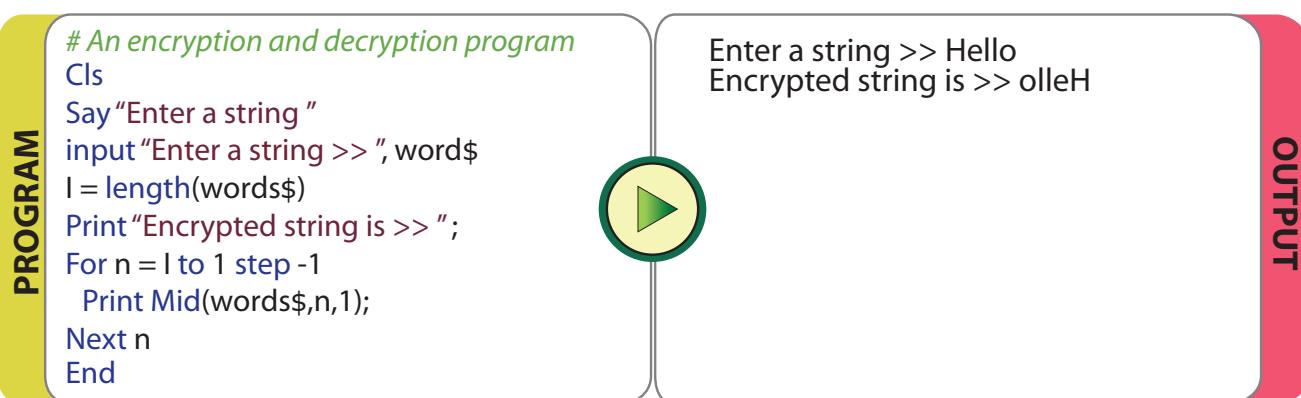
Tejas: Let us now write a program to encrypt and decrypt messages.

Moz: So you want to write a cryptographic package. What is your plan?

Jyoti: We can use the string functions that we explored. For example, given the, string 'Hello', our program will return the encrypted string as 'olleH'.

Tejas: Let us first try out a simple encryption algorithm by reversing a string.

Moz: Good idea.



String functions

Syntax

length (*string*)
left (*string, length*)
right (*string, length*)
mid (*string,length, length*)
upper (*string*)
lower (*string*)

length

Returns the length of a string.

left

Returns a string of length characters starting from the left.

right

Returns a string of length characters starting from the right.

mid

Returns a string of length characters starting from the middle of a string.

upper

Returns an upper case string.

lower

Returns a lower case string.

Info

PROGRAM

```
# print length of string  
print length ("Hello ")  
print length (" ")  
print length ("Oh! It is already 7.00 a.m! ")
```

5
1
27

PROGRAM

```
# left,mid,right,upper,lower  
a$="Superman"  
print left (a$,5)  
print right (a$,3)  
print mid (a$,3,4)  
print upper (a$)  
print lower (a$)
```

Super
man
perm
SUPERMAN
superman

OUTPUT

OUTPUT

Algorithms

As long as $c < 1000$ repeat the following.

(Calculate next fibonacci number which is the sum of prev no. and current no.)

Next fibonacci sequence no
 $c = a + b$

If $c < 1000$ print the fibonacci numbers.

(The previous number and the current number shift in the sequence.)

previous number $a = b$.
Current number $b = c$.

Conditional Statements

```
while condition  
statement(s)  
end while
```

Sub-Routines

PROGRAM

```
addition:  
result = num1  
+num2  
print num1+  
"+" +num2+  
"=" + result  
return
```

Learning Outcome

At the end of this lesson, you will be able to:

- Control the repetition of a sequence of instructions with a condition.
- Define subroutine and use them in the program.
- Use string functions.

WORKSHEETS



1. Complete the following programs by filling in the blanks:

- a. Find numbers whose square is less than 100.

PROGRAM

```

N = 1
square_of_N = N*N
While _____
    if _____ then
        Print N
        N = N+1
        square_of_N = N*N
    Endwhile

```

- b. The names of two groups Red and Blue are stored in two arrays. The member of the groups are as follows:

Red: Namita, Payal, George, Ali, Neha.

Blue: Shakti, Murtaza, Nikhil, Anne, Shabana, Priyanka.

The user is prompted to specify which group list should be displayed.

As per the input from the user, the group names are displayed.

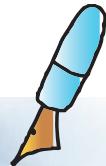
Complete the program by filling in the blanks.

PROGRAM

```

#Declare the array for the two groups
DIM _____
DIM _____
#Assign names of members of group blue to the blue array
_____
#Assign names of members of group red to the red array
_____
# Take the choice of group from the user
Print "Press 1 for group red and 2 for group blue"
input _____
if _____ then
    Gosub _____
    if _____ then
        Gosub _____
        # subroutine to display the group red
        _____:
        For _____
            Print _____
        Next _____
        Return
        # subroutine to display the group blue
        _____:
        For _____
            Print _____
        Next _____
        Return

```



- c. A part of a program to play “Tic Tac Toe” game is given. Fill the call to the subroutine and the statements in the subroutine. In the subroutine, the message “You have won” is given aloud 5 times.

PROGRAM

```
# Tick Tack Toe
...
# Call subroutine to convey message, if the player wins the game
Gosub _____
End

# subroutine to display the message
Message:
For _____
Say _____
Next _____
Return
```

2. Complete the following program using the hints given, and save the code in a file called armstrong.kbs. Run it to get the armstrong numbers between 0 to 999.

PROGRAM

```
# PROGRAM Armstrong Numbers
CLS
PRINT "ARMSTRONG NUMBERS"
PRINT
PRINT "Program computes all Armstrong numbers in the range of 0 - 999."
PRINT "An Armstrong number is a number such that the sum of its digits"
PRINT "raised to the third power is equal to the number itself."
PRINT "407=43+03+73=4*4*4+0+7*7*7=64+343=407"
#initialize total_armstrng to save the count of armstrong numbers between
0-999.
total_armstrng=0
FOR A = 0 TO 9
    FOR B = 0 TO 9
        FOR C = 0 TO 9
            Number= A*100 + B*10 + C
            Sum_Acube_Bcube_Ccube = A^3 + B^3 + C^3
            IF _____
                THEN GOSUB display
                (Hint: Write comparative statement to find if the number is armstrong
                number.)
                NEXT C
            NEXT B
        NEXT A
    END
    display:
    (Hint: Write a statement to count the total number of armstrong numbers
    between 0 to 999. Increment total_armstrng by 1)
    PRINT _____
    (Hint: Write a statement to display the armstrong number, Number.)
    RETURN
```



ACTIVITY

Level VIII | Lesson 8

1. Write a program for calculating squares and cubes of a number and displaying the result:
 - Ask the user to enter a number. (Note: Use the text to speech statement for asking the user.)
 - Call a subroutine to calculate square of the number.
 - Call a subroutine to calculate cube of the number.
 - Display the square and cube of the number.
2. You are given an algorithm where a student's grades for each subject are calculated and displayed. Use the algorithm to write a program in BASIC.

| Marks | Grade |
|--|-------|
| Greater than or equal to 75 | A |
| Less than 75 and greater than or equal to 60 | B |
| Less than 60 and greater than or equal to 50 | C |
| Less than 50 | D |

Algorithm

Algorithm to calculate and display grades in each subject of a student.

1. Initialization
 - a. Define a string array subject\$(4), and assign the names of the subjects {"Maths", "Science", "English", "French", "History"} to the array elements.
 - b. Define a string array grade (4).
 - c. Initialize an integer i=0, for using in while loop.
2. Get inputs
 - a. Ask the user to input his/her name.
3. Calculate
 - a. Write a while loop.
 - b. Execute the while loop for i<4.
 - c. Take input from user for each subject and calculate the grade.
 - d. Call the subroutine calc_grade to calculate the grade.
 - e. Increment i by 1.
4. Print output
 - a. Call subroutine print_grade to print subject and it's grade.
5. End the program.
6. Subroutine calc_grade
 - a. Compare the value with the guidelines given and find the grade.
 - b. Save the grade in the corresponding array element of grade.
7. Subroutine print_grade
 - a. Display a message to indicate whose grades are being displayed. Use the name that the user inputs.
 - b. Write a for loop to display the subject and grade.



ACTIVITY

Level VIII | Lesson 8

3. Text messaging:

Using a cell phone is popular among teenagers. Short forms and symbols are used to abbreviate message and reduce typing. But it is a mystery to some adults. Write a program that will take as input a short form and output the translation and say it loud, for an adult. You may add more words that you think are relevant. Your program should execute continuously until the user enters "TTYL". When the user enters "TTYL" the program ends.

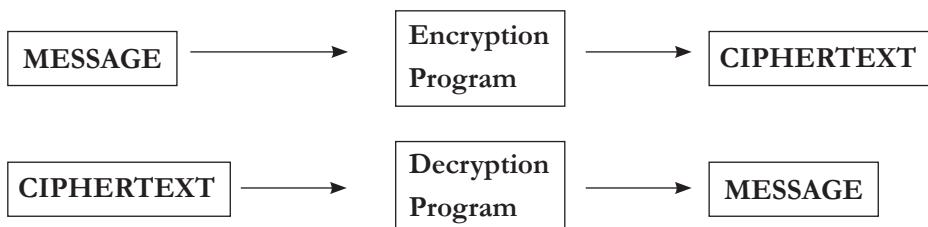
Hint: Use arrays to store the abbreviations and messages.

Use the following abbreviations and translation table:

| Abbreviations | Message |
|---------------|---------------------|
| CU | see you |
| :-) | I'm happy |
| :(| I'm unhappy |
| ;-) | wink |
| :-P | stick out my tongue |
| TA | totally awesome |
| CUZ | because |
| TY | thank-you |
| YW | you're welcome |
| TTYL | talk to you later |

4. Cryptographic package

Recall the various encryption algorithms used in the class. Write two programs. One to encrypt a message. And another to decrypt the message using the encryption algorithm used. Print an encrypted message from your program and ask your friends to decrypt the same. Have fun encrypting and decrypting messages.



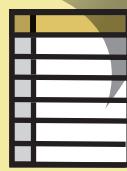
1. Name some different versions/variants of BASIC (eg KBASIC, Visual Basic...)
2. Explore the evolution of BASIC programming language.
3. Find out about mouse control construct/syntax in BASIC 256.

- The objective of this lesson is to study about conditional control in the programming context, with the help of while and if loop constructs.
- The lesson also introduces the concept of subroutine, algorithms and string functions. A subroutine is a user defined function which can be called any number of times in a program.
- Give a demo of using the functions like Sum, Avg that they have already used in Spreadsheet and draw the analogy between these functions and the subroutines in Basic programming language.
- As they are already familiar with flowcharts, tell them that flow chart is a visual representation of an algorithm. An algorithm can be loosely defined as a list of steps (without necessarily the syntax) that need to be performed for a particular program.
- Revise the concepts covered in previous Basic lesson and give some example programs of Do..Until, While-Endwhile, If..Endif loops before they start absorbing the new concepts. The concept of Arrays also should be revisited to enable better understanding.
- For activity 1, before the students write the actual program, ask them to apply the step wise thinking skills to come up with a detailed algorithm, and then convert it to a BASIC program.
- For activity 2, before the students write the actual program, ask them to understand the given algorithm. Ask them to think about what subroutines should be written and which conditional constructs should be used if their teacher wants to enter marks for six subjects, calculate the total, find the average and assign a grade with the help of the given algorithm.
- For the activities 4 and 5, make them write an algorithm, draw a flow chart and then write instructions in Basic.
- Inform the students about the importance of Syntax. Tell them that if proper syntax is not followed, then the program, cannot be executed. Example: See what happens to the program if a while loop is not terminated with the keyword endwhile.
- Give the students a word and ask them how they will use String length functions to check if it is a Palindrome word.
- Twitter uses only 160 characters and some passwords allow only alphabets and letters, ask students to write algorithms for these conditional scenarios.
- Summarize the lesson and help them to write programs not just correctly but elegantly with simple logic and efficient use of various constructs.

Further Reading:

http://en.wikibooks.org/wiki/BASIC_Programming

Notes:



Introduction to Database and DBMS

Aim: In this lesson, you will learn:

- Database, tables, queries.
- Using DBMS tools and software.
- Applications of database.



Jyoti: We are going to Kulu Manali for the holidays. We are looking at the various places that we can visit and which hotel has vacant rooms.

Tejas: It is interesting to know that the website provides room vacancy details along with dates. This information is also updated regularly!

Moz: Yes. A database is used to store such data and a database management system is used to retrieve information.

Jyoti: How is the data stored in the database?

Moz: Data is stored in tables. These tables are organized in such a way that information required can be easily retrieved. For example, consider a hotel in Kulu Manali. You want to stay in this hotel. What is the information required by you to book a room in this hotel?

Tejas: Room's vacancy status for some particular dates.

Moz: What data would be required to find room vacancy information?

Jyoti: We would need data on: (1) Rooms in the hotel and their details, (2) Room occupancy details.

Moz: Right. You have defined two tables for a hotel database, one where room details are stored and the other where the room occupancy details are stored.

Database

A database is a collection of data that is organized for easy access, retrieval and management of its contents. A database has one or more related tables of data. The data can be any format like text, numeric, images, audio, and video.

Moz: How will you extract the data that you require?

Jyoti: Based on the room occupancy details, we can find if rooms are available for our dates.

Moz: Yes, this process is called information extraction. It is also called querying the database. A Database Management System provides the software programs and tools to control the creation, maintenance and use of a database.

Tejas: What does control mean here?

Moz: In the hotel reservation database, room occupancy is entered by the hotel management. The management does not want anyone to access these tables and modify the data. So, they may restrict view of these data to selected users. There are inbuilt procedures in DBMS which make sure that such requirements are met. This is control of a database.

| Concept | Database management system (DBMS) |
|---------|---|
| | Database management system (DBMS) is a software package that provides software programs to control the creation, maintenance and use of a database. |

| Info | DBMS tools and software |
|------|--|
| | <p>The software programs in a DBMS provide tools and software programs as follows:</p> <ul style="list-style-type: none">• Create and maintain users of database and database administrators.• Define and create the tables.• Enter, update and maintain data.• Retrieve information and reporting tools. <p>Some popular DBMS packages are: Oracle, Microsoft Access, MySQL, PostgreSQL, Open Office database.</p> |

Moz: Where else do you think DBMS are used?

Jyoti: Railway and airline ticket booking.

Tejas: In our school to maintain the records of students, library.

Moz: Yes. Databases are used in many online applications.

| Info | Database Applications |
|------|--|
| | <p>Example of applications where database is used are:</p> <ul style="list-style-type: none">• Railway and Airline: For schedules and reservation.• Banking: For customer information, accounts, loans, transactions like deposits and withdrawal of money.• Universities and schools: Student and teacher information, issue of books in library, office for financial transactions like student fee collection and salary of teachers.• Telecommunication: For keeping track of number of calls made and preparing bills.• Shops: For displaying prices and preparing bills, keeping track of inventory and fast moving goods. |

Moz: Now look at the following table which belongs to a school database. Note the technical terms that are used for each part of the table.

class_8_student_info

| Student_id | Name | Date of birth |
|------------|---------|---------------|
| 12 | Sweta S | 23/01/97 |
| 34 | Tejas | 14/12/96 |
| 23 | Jyoti | 15/08/96 |
| 45 | Gurmeet | 25/03/97 |
| 67 | Ali | 01/01/97 |
| 195 | Sweta G | 16/11/96 |

Concept

Primary key

Step 3: Specify Primary key

- A primary key uniquely identifies a record.
- A primary key does not allow duplicate values.

Info

Technical terms used for each component of a table in the database.

Each row of a table is called a record.

| Student_id | Name | Date of birth |
|------------|---------|---------------|
| 12 | Sweta S | 23/01/97 |

Record

Headings of columns in a table are called the field names.

| Student_id | Name | Date of birth |
|------------|---------|---------------|
| 12 | Sweta S | 23/01/97 |

Field name

Each cell in a table is called the field and contains one item of data in the record.

| Student_id | Name | Date of birth |
|------------|---------|---------------|
| 12 | Sweta S | 23/01/97 |

Cell

The unique column which uniquely identifies a record is called the primary key.

| Student_id | Name | Date of birth |
|------------|---------|---------------|
| 12 | Sweta S | 23/01/97 |

Primary key

Moz: Here is another table showing the class and marks.

class_8_marks

| Student_id | English | Maths | Science | Social studies | Second language (SL) | Marks (SL) |
|------------|---------|-------|---------|----------------|----------------------|------------|
| 34 | 70 | 76 | 63 | 54 | French | 89 |
| 23 | 58 | 92 | 78 | 65 | Hindi | 65 |
| 67 | 80 | 98 | 87 | 76 | French | 70 |
| 195 | 51 | 78 | 56 | 67 | Marathi | 73 |
| 45 | 48 | 52 | 65 | 56 | French | 62 |
| 12 | 73 | 88 | 75 | 77 | Hindi | 78 |

Moz: Let us extract information from these two tables we have seen so far. How will you query the database to find names of students who scored 70 and above marks in English?

Jyoti: First find the roll numbers of students who scored 70 or more marks in English from the class_8_marks table. Then find their names from class_8_student_info table and display the list of these names.

Students who scored more than 70 and above marks in English.

Tejas

Ali

Sweta S

Concept

Query

Extraction of information

A “query” is a special view of a table corresponding to some desired information to be extracted. A query can display chosen records or chosen fields within records. A query can apply to one table or to multiple tables, if they are linked by common data fields.

Moz: Good. How do you find the average age of students in the class?

Tejas: We can find the age from the date of birth of students in the student_info table and calculate the average age. Here we are using only one table.

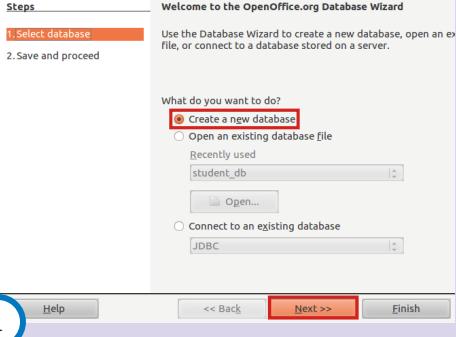
Moz: Right. This is how database querying works. Let us do this practically using a database application provided by Openoffice. Let us take the example of your school data to understand database creation and information extraction.

Creation of a database

- i. Start Open office database: Openoffice → OpenOffice.org database
- ii. The Database Wizard helps you to create a database file and to register a new database within OpenOffice.org.

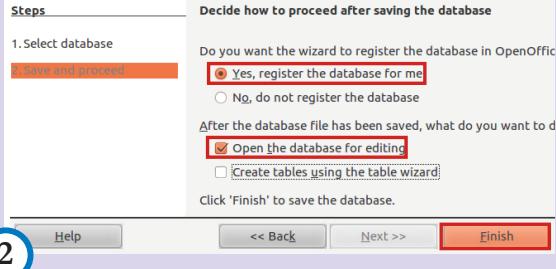
Skill

Step 1: Creating a new database.
Select Create a new database and click on next.



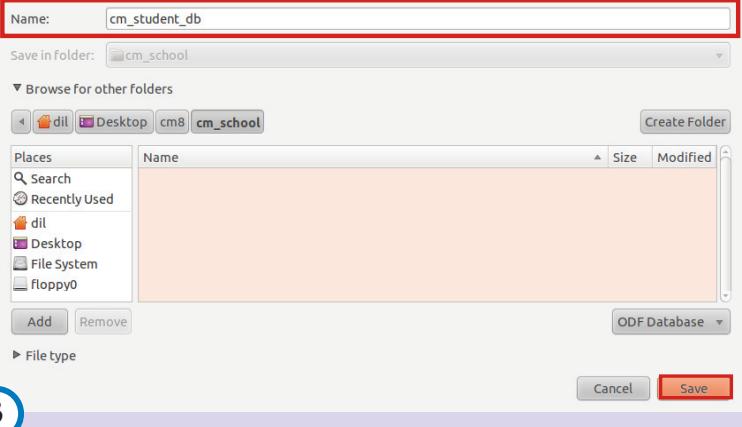
1

Step 2: Registering a database.
Save and proceed with default settings and click Finish.



2

Step 3: Naming a database.
Give an appropriate name (ex: cm8_db) to the database and click on Save.

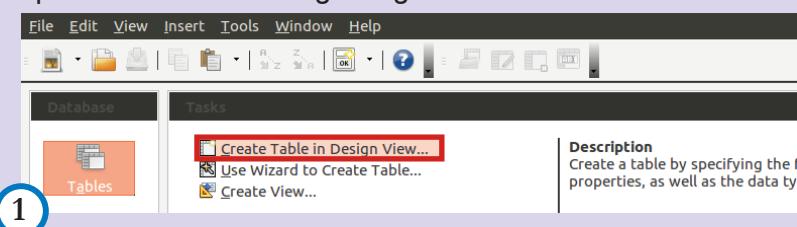


3

Creation of a table

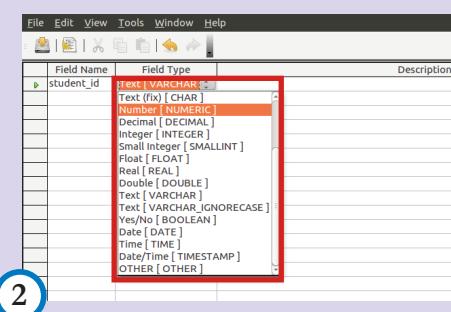
- i. Open the database file (cm8.odb). Click the Tables icon. Choose Create Table in Design View to create a new table.
- ii. Using this option you can create tables by defining the fields of the table required by your application.

Step 1: Create table using design view.



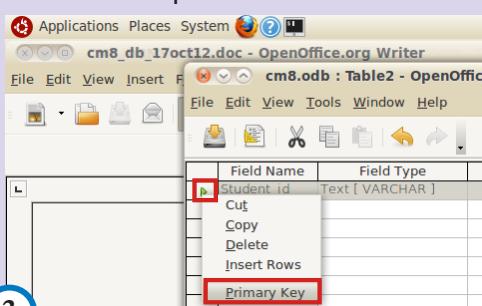
Step 2: Table field names with datatype definition:

- Enter new fields in rows from top to bottom. Click the Field Name cell and enter a field name for each data field.
- In the next cell to the right, define the Field Type. When you click in the cell, you can select a field type in the drop-down menu.



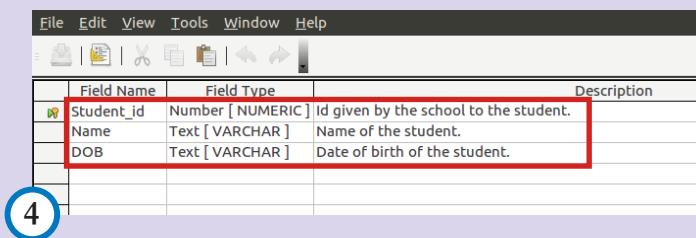
Step 3: Select a primary key:

- See Example below.



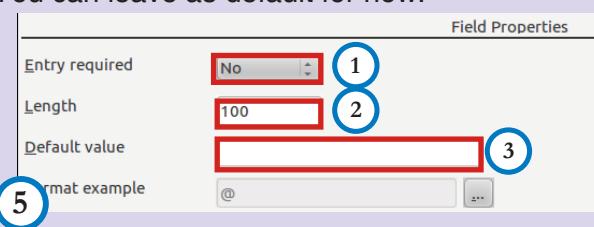
Step 4: All fields and data types defined

You can enter an optional Description for each field. The text of the description will appear as a tip on the column headings in the table view.



Step 5: Field properties

Field properties specify the data entry rules. Help is provided in the right most column. You can leave as default for now.



Step 6: Give a name to the table and Save.



Specify Primary key

Example

- Student_id uniquely identifies a student. Right-click the first column, and choose Primary Key from the context menu. Note that, to edit the table contents a primary key has to be specified.

Inserting Data into the table

There are many options of inserting data into a table. Data can be entered using a form, from data sources like spreadsheet or another database and table data view. Following is an example of inserting data using Table Data view.

Skill

Step 1: Select the table for data insertion. Double click to open the table.

1

Step 2: An empty table to insert data opens. Note that the same procedure is followed to view, add and edit existing data.

2

Step 3: The table std_personal_info with 6 records.

3

Query - Extracion of information

An example to create a query to view all the data in a table follows:

1. In a database file window, click the **Queries** icon. Three options are available. Click on the **Use Wizard to Create Query**.

The 'Queries' icon is highlighted with a red box. The 'Tasks' pane shows three options: 'Create Query in Design View...', 'Use Wizard to Create Query...', and 'Create Query in SQL View...'. The 'Use Wizard to Create Query...' option is also highlighted with a red box. A 'Description' box to the right explains that the wizard will guide you through the steps necessary to create a query.

Skill

Step 1: Creation of a query using the query wizard

- The wizard guides you through the steps of creating a query. The tables and their fields that have to be included in the query can be specified using the wizard.
- Selecting the table and its fields for query.

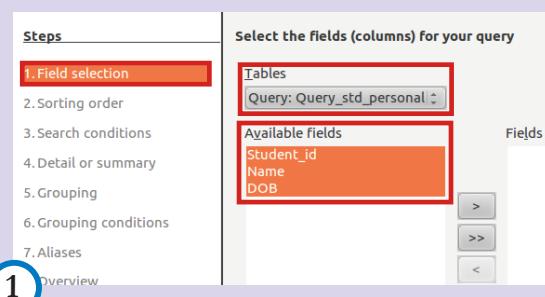
Tables: Specifies the table for which the query is to be created.

Available fields: Lists the names of the database fields in the selected table or query. Click to select a field or hold down the Shift or the Ctrl key while you click to select more than one field.

Step 2: Assigning aliases to the field names.

Aliases

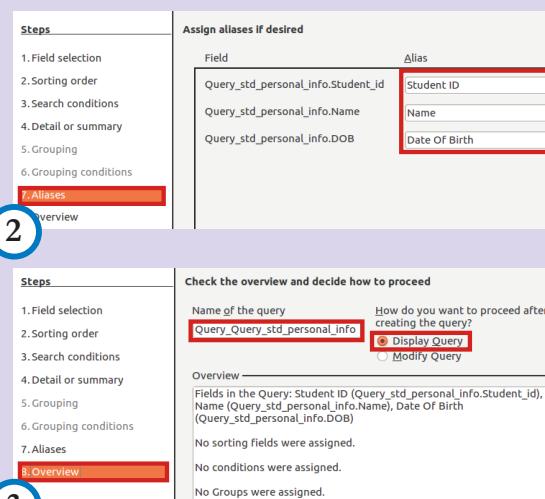
Assigns aliases to field names. Aliases provide more user-friendly names, which are displayed in place of field names. For example, alias of DOB field can be Date of Birth.



Step 3: Saving the query

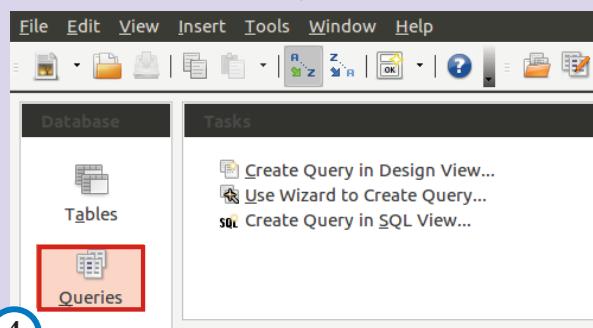
Overview

Enter a name of the query, and specify whether you want to display or to modify the query after the Wizard is finished.



Step 4: View query results

In a database file window, click the Queries icon. Select the query and double click to view the results of the query.



| Student_id | Name | DOB |
|------------|---------|----------|
| 45 | Gurmeet | 25/03/97 |
| 12 | Sweta S | 23/01/97 |
| 195 | Sweta G | 16/11/96 |
| 23 | Jyoti | 15/08/96 |
| 34 | Tejas | 14/12/96 |
| 67 | Ali | 01/01/97 |

Multiple tables

Skill

Step 1: Create one more table

Create class_8_marks table in cm8_db database.

Enter the marks of each student in the marks table.

| Student_id | English | Maths | Science | social_studies | SL |
|------------|---------|-------|---------|----------------|---------|
| 12 | 73 | 88 | 75 | 77 | Hindi |
| 23 | 58 | 92 | 78 | 65 | Hindi |
| 34 | 70 | 76 | 63 | 54 | French |
| 45 | 48 | 52 | 65 | 56 | French |
| 67 | 80 | 98 | 87 | 76 | French |
| 195 | 51 | 78 | 56 | 67 | Marathi |

Create relation between tables

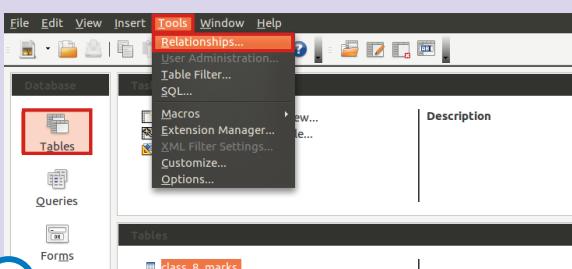
Defining the relationship between the std_personal_info and class_8_marks tables.

Moz: What is common between the std_personal_info table and std_marks table?

Jyoti: The Student_id is same in the both tables.

Moz: Yes. This needs to be specified to the database. The tools menu provides the option Relationship to specify this relation between the two tables.

Step 1: Select Tools → Relationship



Selecting tables for defining relationship.
Relationships can be defined using two methods.
We will study one method here.

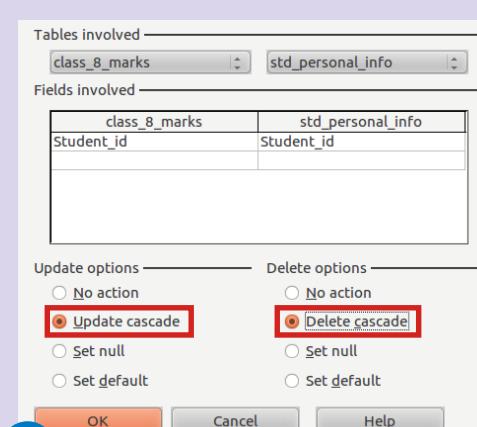
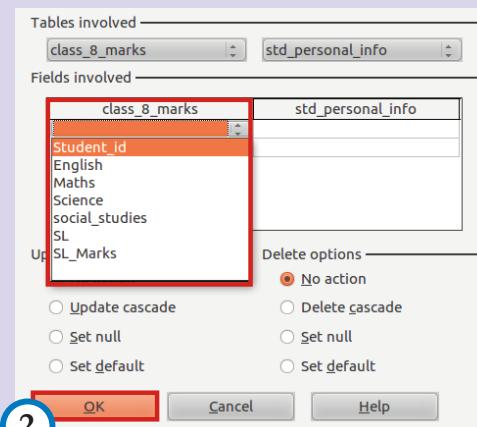
Step 2: Creating Relationship
Select Insert → New Relation.

- This opens the Relations window.
- The two tables are listed in the Tables involved section.
- In the Fields involved section, click the dropdown list under the class_8_marks label. Select student_id from the fields list.
- Click in the cell to the right of this dropdown list. This opens a dropdown list for the std_personal_info table.
- Select student_id from the std_personal_info table list.
- Click OK.

Step 3: Modifying the Update options and Delete options.
These options permit you to update a table that has a relationship defined with another table. It also permits you to delete a field from the table.

Example: Suppose a student has left the school. The database needs to be modified as follows:

- Remove the records from the student_personal_info table.
- Remove records of the student from the class8_marks table.
- By selecting 'Delete cascade', the records of the student are removed from both the tables by default. The same applies to Update cascade. When a field in a relationship is updated then the field in other tables is also updated.
- Select Update cascade and Delete cascade.

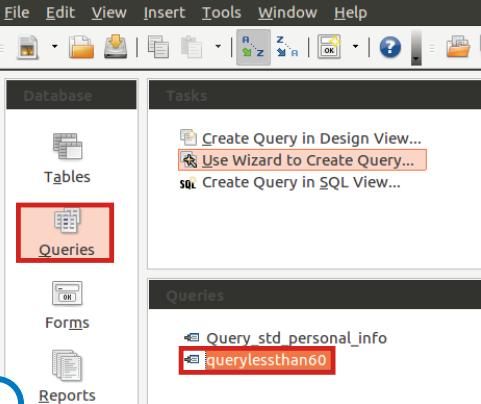


Query with multiple tables

Let us build a query to display names of students who scored more than 70 in English.

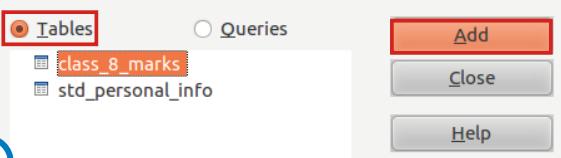
Skill

Step 1: Select queries → design view.



1

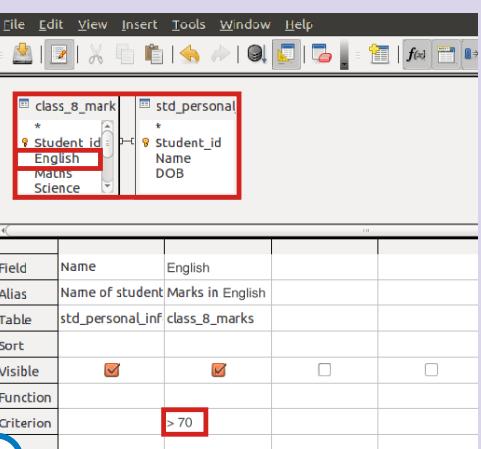
Step 2: Add tables in the query by selecting table and clicking on Add.



2

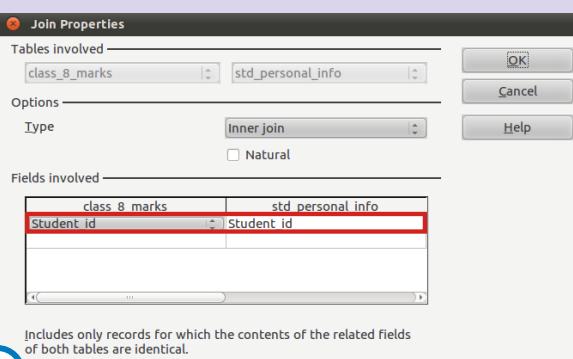
Step 3: The lower pane of the Design View is where you define the query. To define a query.

- Specify the database field names to include by clicking on the arrow in the field column.
- Specify alias and the criteria > 70
- Specify whether the data in the field should be displayed.



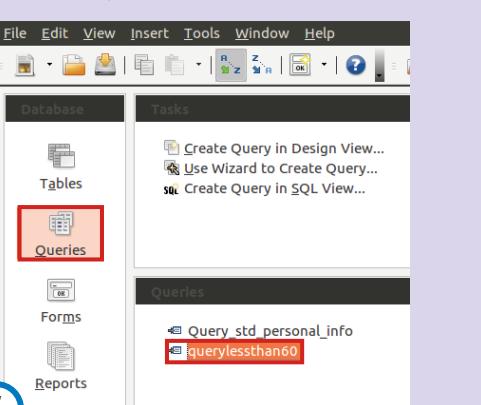
3

Step 4: Double click on the link between the tables. the relation between the two tables (which has already been set) is shown. This specifies to the database to take student_id of students with > 70 marks in English and get the name of the student from std_personal_info table and display.



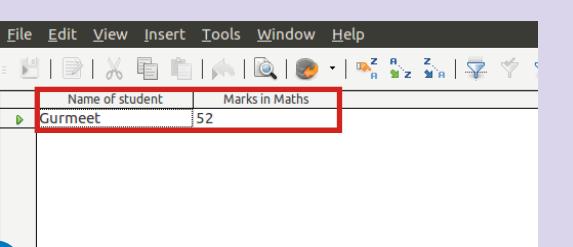
4

Step 5: Double click on the query name to display the results.



5

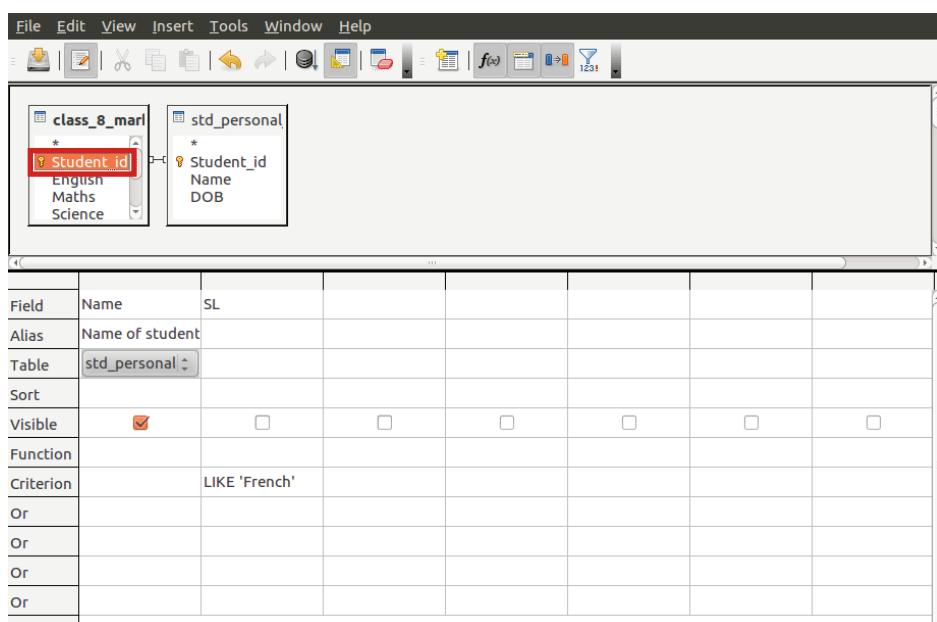
Step 6: Results of the query Names of students who scored more than 70 in English.



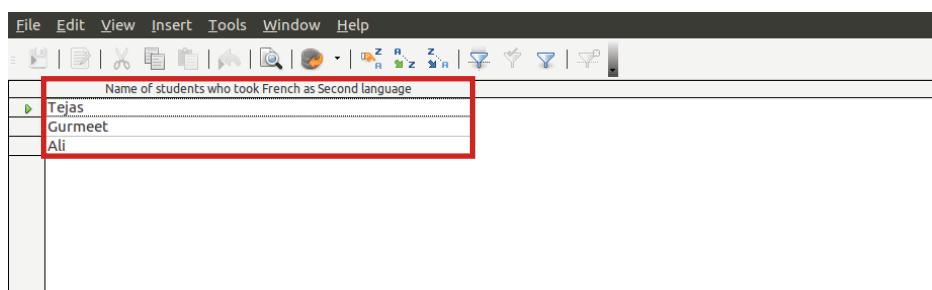
6

Query 2: Build a query to display ID of students who have taken French as second language.

Note: how text is compared in this query.  String comparison in Basic



| Field | Name | SL | | | | |
|-----------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Alias | Name of student | | | | | |
| Table | std_personal | | | | | |
| Sort | | | | | | |
| Visible | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Function | | | | | | |
| Criterion | | LIKE 'French' | | | | |
| Or | | | | | | |
| Or | | | | | | |
| Or | | | | | | |
| Or | | | | | | |

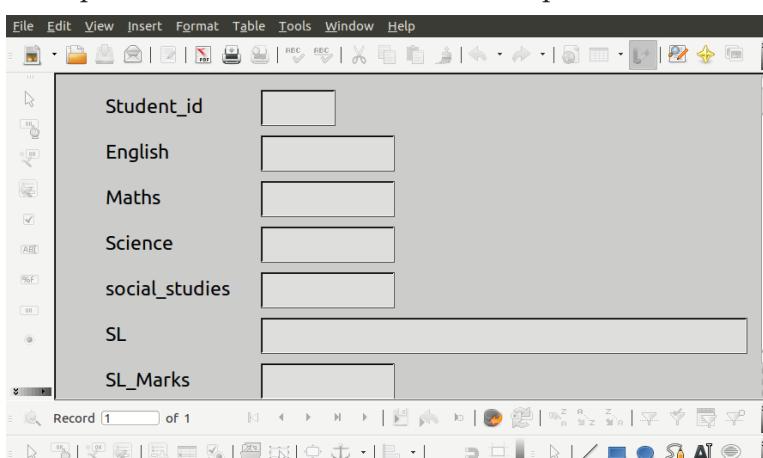


| Name |
|---------|
| Tejas |
| Gurmeet |
| Ali |

Forms

- Using forms, you can define how to enter data or present the data. Similar to table creation and query creation, options to use a wizard for forms are available. Explore this option to create forms of your choice.

Example of a form to enter Marks data is provided below:

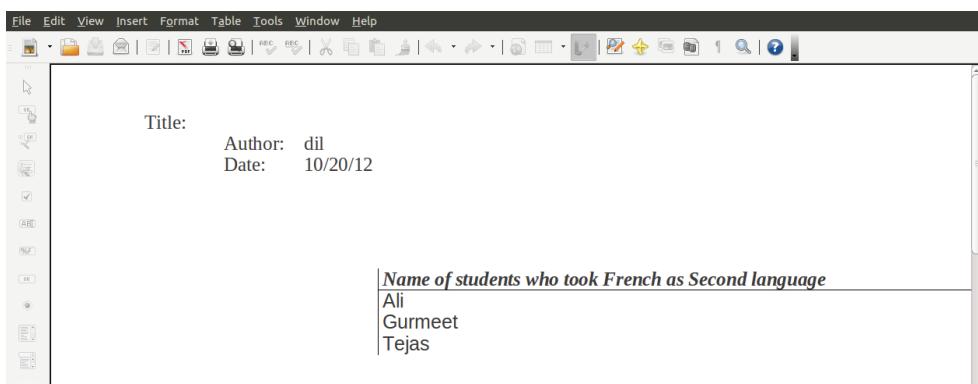


Recall

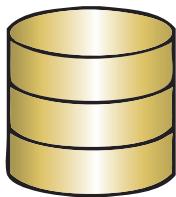
- Comparison operators compare two expressions and return a Boolean value that represents the relationship of their values.

Reports

- A report is a Writer text document that can show your data in an organized manner. In OpenOffice.org Base, you have a choice to create a report either manually using drag-and-drop in the Report Builder window, or semi-automatic by following a series of dialogs in the Report Wizard. An example of a report of the query results students who took french as second language is given below:



Databases



Information

DBMS



Tools

Application

Banks

Address book

YouTube

Hotels

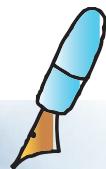
Railways

Learning Outcome

At the end of this lesson, you will be able to:

- Design database tables.
- Create and use database.
- Query database for information.

WORKSHEETS



1. Fill in the blanks by using the phrases given below.

| | | |
|--|--|--|
| i. Database is | | a. Enter, Maintain and update data in database |
| ii. DBMS is a software package to | | b. Railway reservation, facebook registrations |
| iv. Database applications for example are | | e. Control the creation, maintenance and use of a database |
| vi. DBMS Software programs and Tools are used to | | g. Collection of data in organized tables. |

2. In the following table label

① Table name ② Field name ③ Field ④ Record ⑤ Primary key

Product_details → _____

| Product_id | Product_name | Price_in_rs |
|------------|----------------|-------------|
| 12389 | Chocolate_cake | 200 |

Product_details → _____

Product_details

| Product_id | Product_name | Price_in_rs |
|------------|----------------|-------------|
| 12389 | Chocolate_cake | 200 |

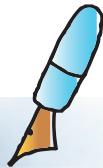
Price_in_rs → _____

Product_details → _____

3. A table to record the commuting details of students from home to school is added to the database maintained by the school. Commuting details of the students are given below:

- Sweta S with Student_id 12 stays in Mulund which is a distance of 4 kms from school and travels by bus.
- Tejas with student_id 34 stays in Kanjurmarg which is a distance of 1 km from school and walks to school.
- Jyoti with Student_id 23 stays in Vikhroli which is a distance of 2 kms from school and travels by bus.
- Gurmeet with Student_id 45 stays in Kanjurmarg which is a distance of 1 km from school and comes to school in car.
- Ali with Student_id 67 stays in Vikhroli which is a distance of 2 kms from school and travels by auto.
- Sweta G with Student_id 195 stays in Mulund which is a distance of 4 kms from school and travels by bus.

WORKSHEETS



Use above information to fill missing data in the table Class8_commute_details.

std_personal_info

| Student_id | Name | DOB |
|------------|----------|----------|
| 45 | Gurumeet | 25/03/97 |
| 12 | Sweta S | 23/01/97 |
| 195 | Sweta G | 16/11/96 |
| 23 | Jyoti | 15/08/96 |
| 34 | Tejas | 14/12/96 |
| 67 | Ali | 01/01/97 |

Class8_commute_details

| Student_id | Name | Place of Residence | Mode of travel | Distance |
|------------|---------|--------------------|----------------|----------|
| 12 | Sweta S | Mulund | Bus | 4 km |
| 34 | | Kanjurmarg | Walk | |
| 23 | Jyoti | | | 2 km |
| 45 | | Kanjurmarg | Car | 1km |
| 67 | | Vikhroli | | |
| 195 | Sweta G | | | 4 km |

a. Using the above tables answer the following:

- Name of the table: _____, _____
- Write the data type of each field in the following:

| Field name | Data Type |
|--------------------|-----------|
| Student_id | Number |
| Place of residence | |
| Mode of travel | |
| Distance | |
| Place of residence | |

- For the queries given in the table below, give the name or names of tables that will be used for the query, the condition and the result that will be displayed for the query:

| Query | table name or table names | Condition | Result of the query |
|---|---------------------------|-----------|---------------------|
| Query 1 ID of students who stay in Mulund. | | | |
| Query 2 Name of the students who travel more than one km. | | | |
| Query 3 Name of the students who travel by bus. | | | |

WORKSHEETS



b. Build queries for the following in the query tables given below:

- What is the procedure to display all the fields and data in the table?

- List the name of student, and in ascending order of the distance travelled by students.
 - One table is added. Write the name of the second table and its fields. Draw the relationship between the tables.
 - Fill in Fields in the query, fields to be displayed, sort field, alias.

File Edit View Insert Tools Window Help

std_personal
*
Student_id Name DOB

| Field | | | | | | |
|-----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Alias | | | | | | |
| Table | | | | | | |
| Sort | | | | | | |
| Visible | <input type="checkbox"/> |
| Function | | | | | | |
| Criterion | | | | | | |
| Or | | | | | | |
| Or | | | | | | |
| Or | | | | | | |
| Or | | | | | | |
| | | | | | | |

- List names of students who travel by bus.
 - One table is added. Write the name of the second table and its fields. Draw the relationship between the tables.
 - Fill in Fields in the query, alias. fields to be displayed, criterion.

File Edit View Insert Tools Window Help

std_personal
*
Student_id Name DOB

| Field | | | | | | |
|-----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Alias | | | | | | |
| Table | | | | | | |
| Sort | | | | | | |
| Visible | <input type="checkbox"/> |
| Function | | | | | | |
| Criterion | | | | | | |
| Or | | | | | | |
| Or | | | | | | |
| Or | | | | | | |
| Or | | | | | | |
| | | | | | | |



ACTIVITY

Level VIII | Lesson 9

1. Use Application → Office → Openoffice.org Database to create the database, tables and queries as shown in the lesson. Add the commuting table from worksheet and build the queries. Save your results.
2. Design and add two tables for storing teachers personal information and subjects they teach. Create another table for storing the standards that the teacher is teaching.

Hint: Create a teacher-id as unique id. This will help you create relationships among the tables. Insert 10 records in each table.

3. Build queries to extract the following information from teacher_db.

- i. List name of teachers and area in which they stay.

Example

| Name of teacher | Area of stay |
|-----------------|--------------|
| Farida | Powai |
| Rekha | Powai |
| Swati | Mulund |
| Sameer | Mulund |

- ii. List the name of teachers who teach standard eight.

Example

| Teachers who teach standard eight |
|-----------------------------------|
| Sameer |
| Rekha |

- iii. List the name of teachers who teach Science.

Example

| Teachers who teach Science |
|----------------------------|
| Swati |
| Rekha |

- 
1. Creating tables using wizard.
 2. Creating queries using design forms.
 3. How and where do SNS uses databases?

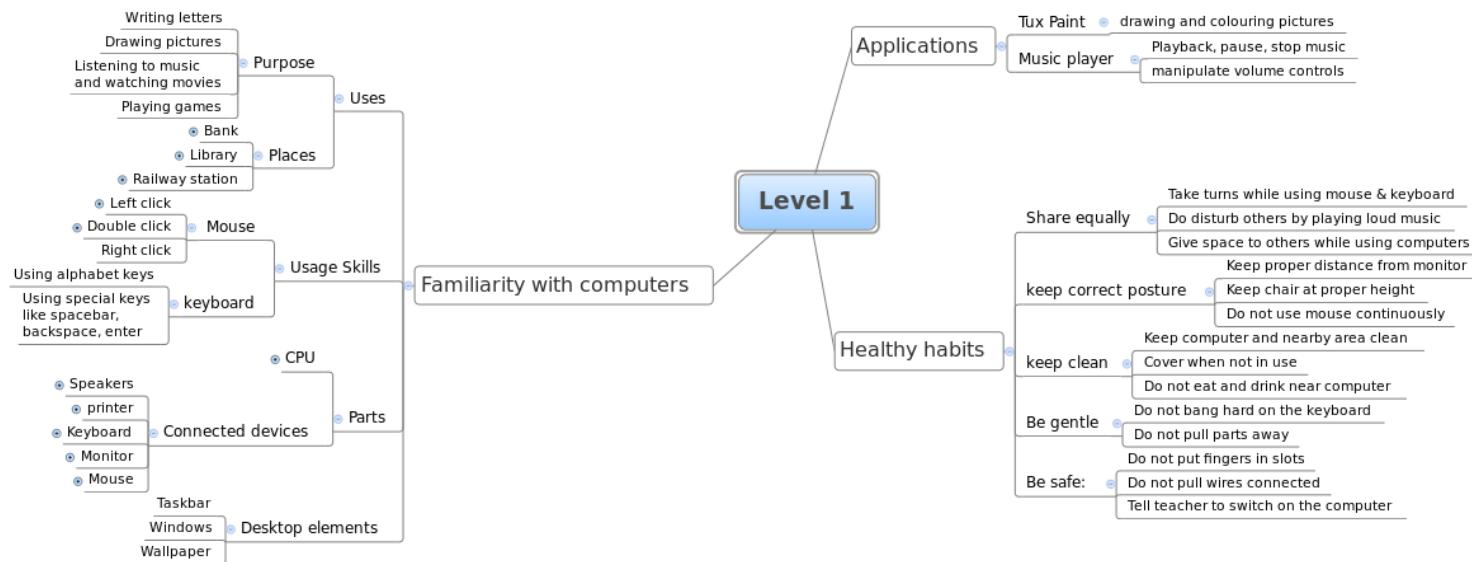
- The objective of this lesson is to study about database concepts, database management tools, querying a database for specific information and list various examples of database applications.
- After the term 'database' is explained, question them about the possible database examples that they have encountered or used.
- Most probable answers will be: student details in schools, book catalogues in a library, class timetables or employee data in offices.
- Expand these examples to reinforce the concepts about how database tools today have simplified the process of large data management, data reporting and data visualization.
- Make it clear that an exposure to database concepts is very important as, in today's Internet world, many sites use databases for a variety of functions. Even though we might be only end users of these sites (ecommerce, travel, search) it is good to know how these web applications work.
- Inform them that Oracle, DB2, Sybase, Postgres, and MySQL are some of the popular DBMS packages used by the industry. While Oracle and Sybase are proprietary, Postgres and MySQL are Open Source base. Interested students can explore more on these tools.
- Take them through an online bookstore. The search criteria for books can be a combination of genre, author, language, cost, rating, used, new, for children, for adults, and so on.
- Explain that all the data about the books is stored in back end database tables. The likely tables could be an Author table, Publisher table, and Category table etc. Revise the concepts of back end and front end covered in the blogging lesson.
- When a user is looking for a particular book eg: Paperback edition of "Harry Potter" by J.K.Rowling, the query which is built in the program is executed. The program fetches the relevant results which are then displayed on the webpage.
- Some of the simple queries covered in the lesson about students taking a particular language can be reinforced by drawing a parallel to Venn diagrams and Intersections. (A: Set of 8th grade students, B: Set of students taking French, then A intersection B is set of all 8th grade students taking French).
- Show them Google analytics for a particular site to demonstrate how data about the site users is aggregated and compiled with the help of tools. These tools use complex queries to come up with the required information.
- In the lab, use Open office database application to show how database tables are created, how data is inserted and queried.
- As they have already used websites like Youtube, flickr, ask them to name some sample tables and fields used by these sites. Also question them about how a query statement would look like for a particular search (example: display photos taken on a particular date on flickr).
- Give them a small assignment of creating an family online entertainment database with a list of all music CDs and movie DVDs they have at home.
- Search for a free drag and drop GUI based simple web application developer which uses a database to demonstrate in the class (example: Zoho, Grubba..)
- Summarize the lesson and ensure that all the worksheets and activities are completed at regular intervals.



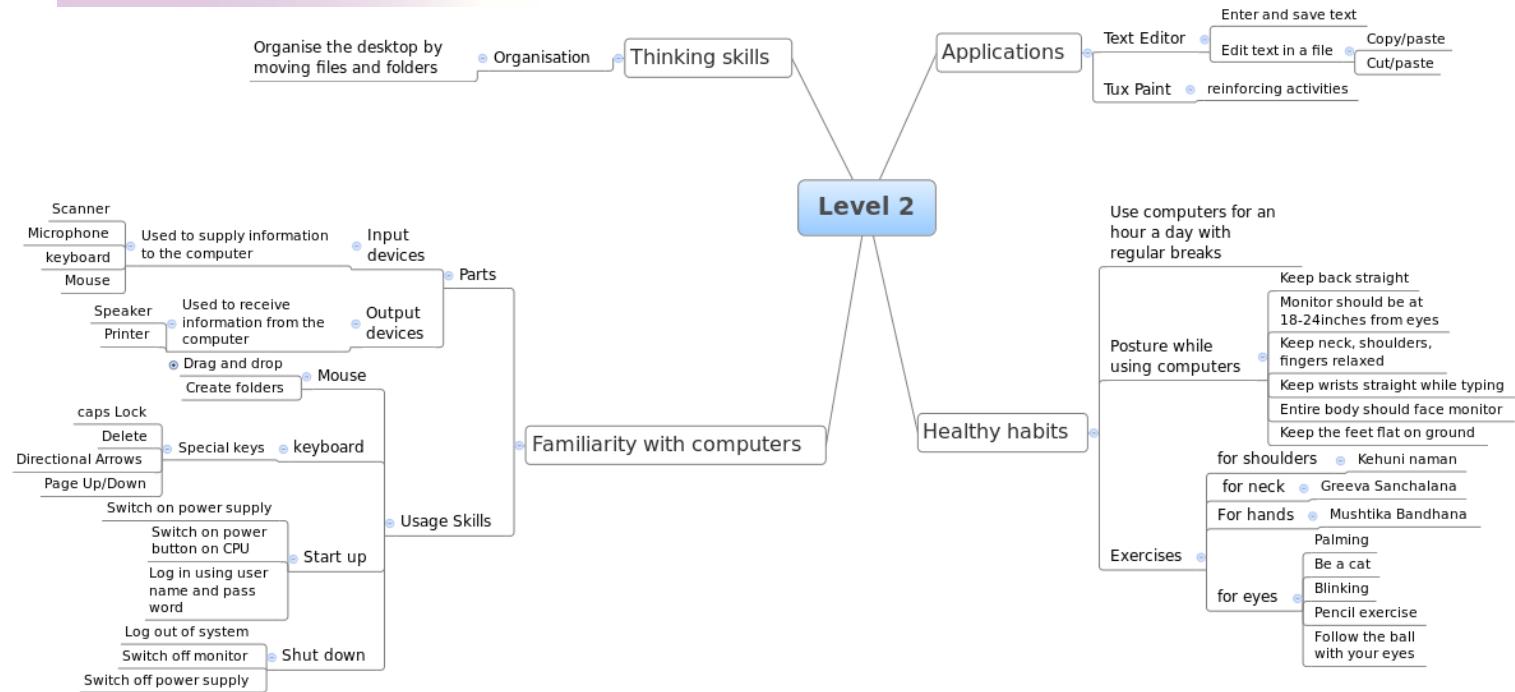
Further Reading:

http://wiki.openoffice.org/wiki/Documentation/OOo3_User_Guides/OOo3.3_User_Guide_Chapters
<http://en.wikipedia.org/wiki/Database>
http://en.wikipedia.org/wiki/Database_management_system
<http://cs.fit.edu/~pbernhar/dbms.html>

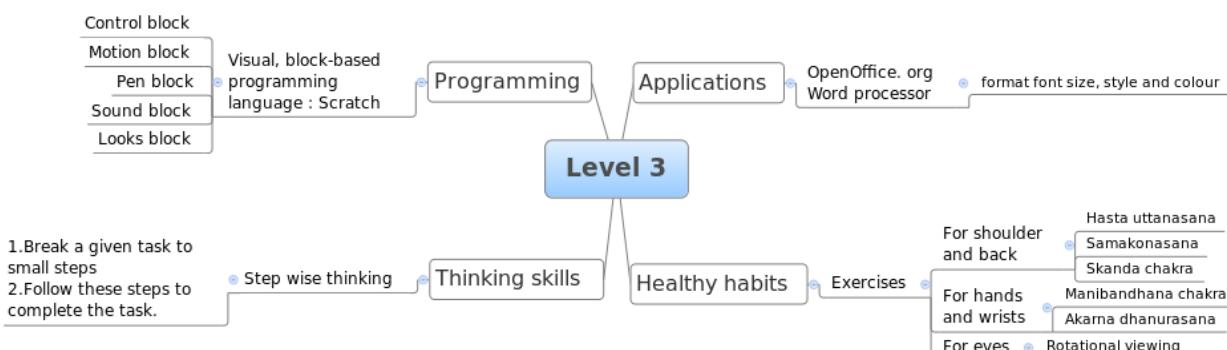
Computer Masti Level 1



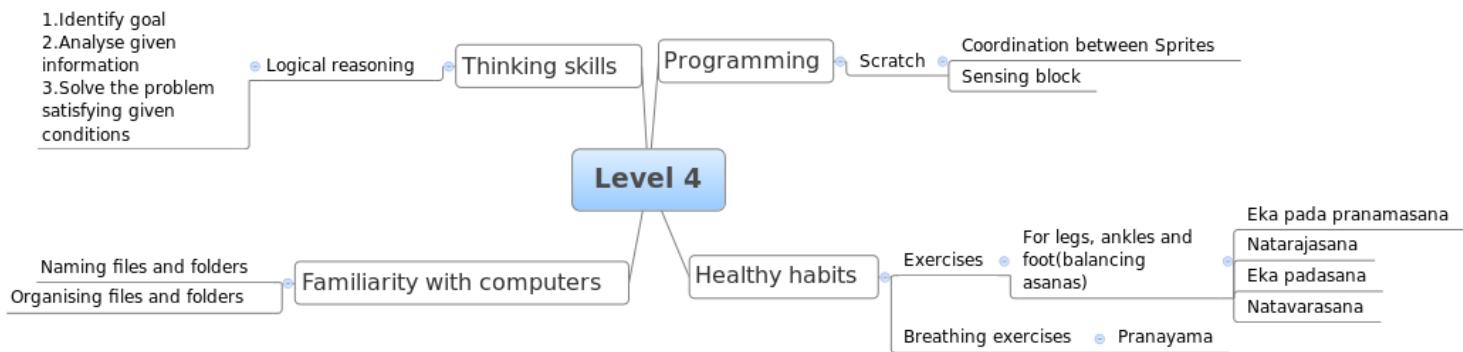
Computer Masti Level 2



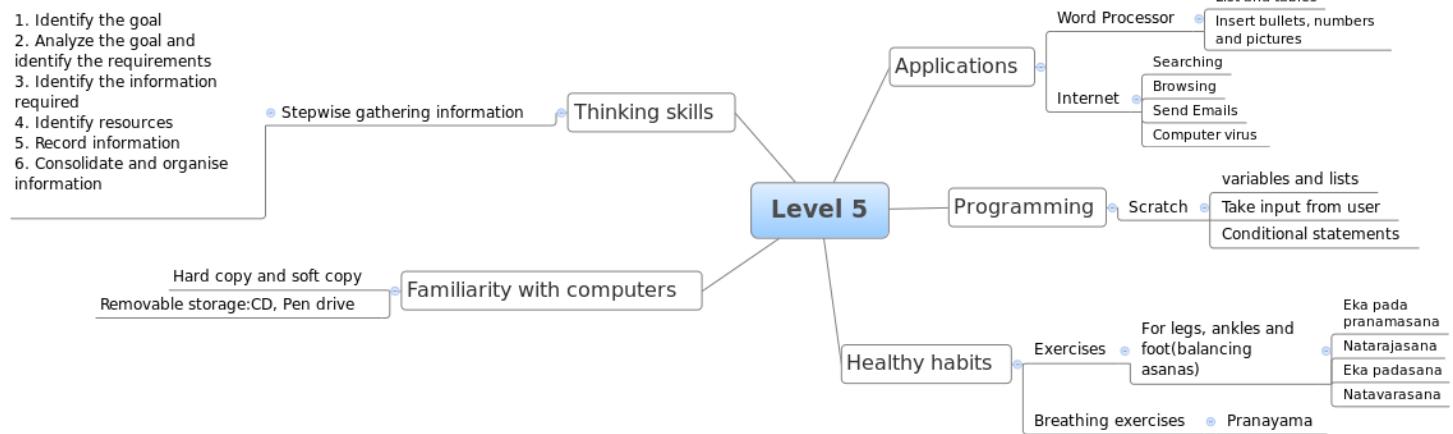
Computer Masti Level 3



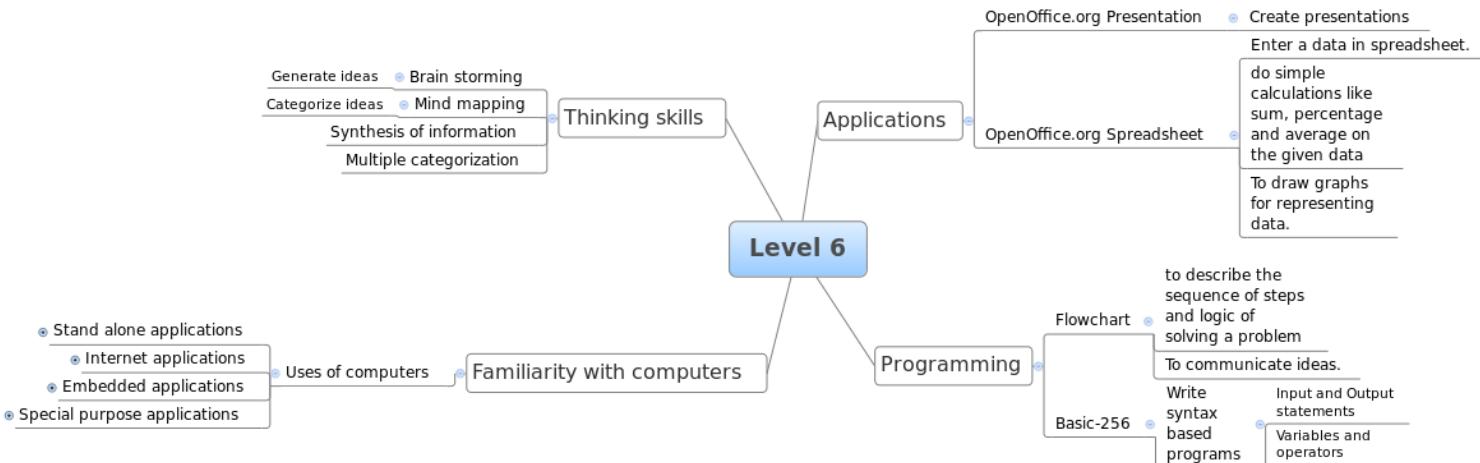
Computer Masti Level 4



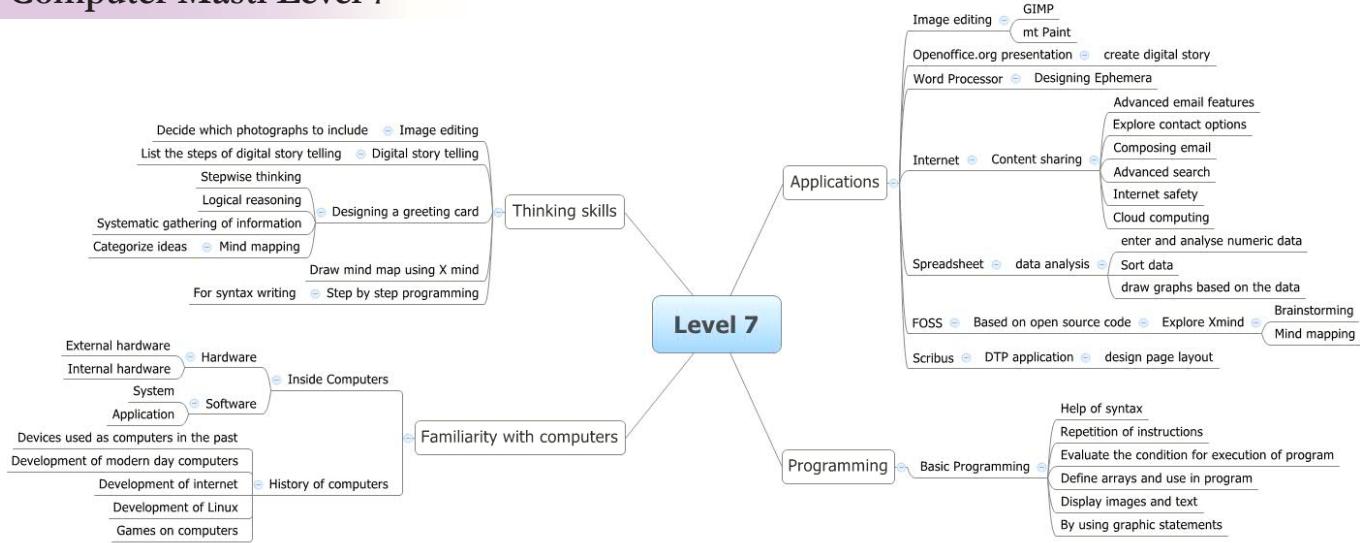
Computer Masti Level 5



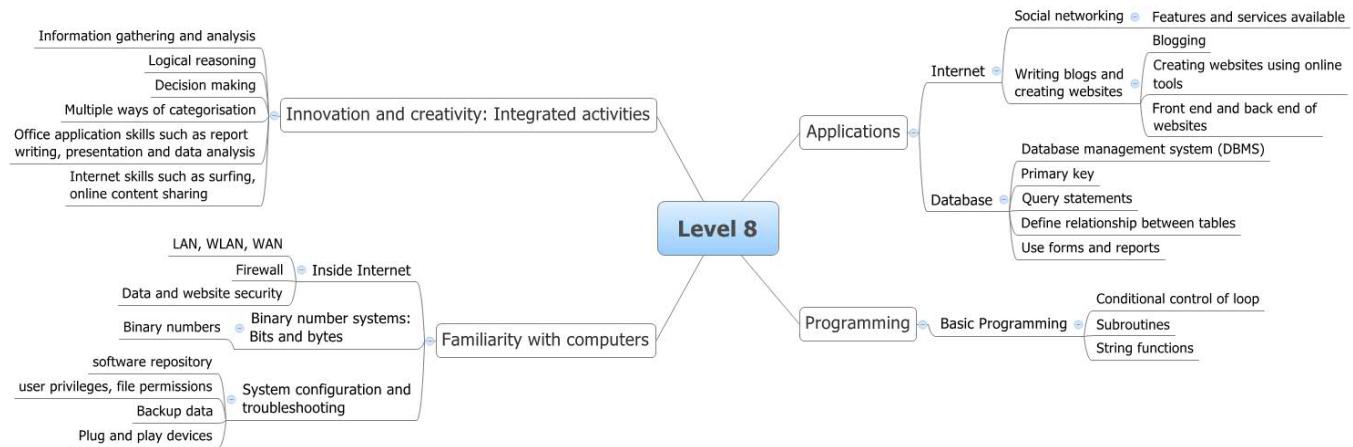
Computer Masti Level 6



Computer Masti Level 7



Computer Masti Level 8



Other books in Computer Masti series



The CD contains the Computer Masti Toolkit (for Windows Operating System) for the applications used in the book. Readers can also download a customized Operating System for Computer Masti at www.computermasti.com/download. Please write to us at info@computermasti.com for further information on Computer Masti.



Computer Masti (CM) is a research based product, created and developed at IIT Bombay, in collaboration with InOpen Technologies, for effectively teaching computers in schools. It is designed as a series of text books, based on a curriculum suitable for the primary and secondary school students. The book is accompanied by a CD which contains several interactive educational software, and games. CM books have been translated into eight Indian languages and more translation efforts are ongoing. The e-book downloads have been increasing almost on a daily basis.



Educational Computer Games



Programming



Collaborative Learning



Teacher's Corner

Salient Features



Thinking Skills



Projects



Ergonomics



Online Version



Open Source



Spiral Curriculum



Constructivist Approach

- Computer Masti Toolkit which can be installed on Windows Operating system.
- Free and open source applications referred to in the book, such as:
 1. Office applications: Open Office - A multiplatform and multilingual office suit, compatible with all other major office suites.
 2. Multimedia: Semantik, XMind for graphical representations, Scribus for layout and publishing, Audacity for audio recording and editing, Shotwell for managing photos , GIMP for editing images.
 3. Simulators: Kstars a Desktop Planetarium for KDE, ACM aerial combat simulator a multi player air combat simulator
 4. Programming: Basic-256 for syntax based programming.
 5. Miscellaneous: Homebank for accounting, Google earth for geographical information of the world in 3D.



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