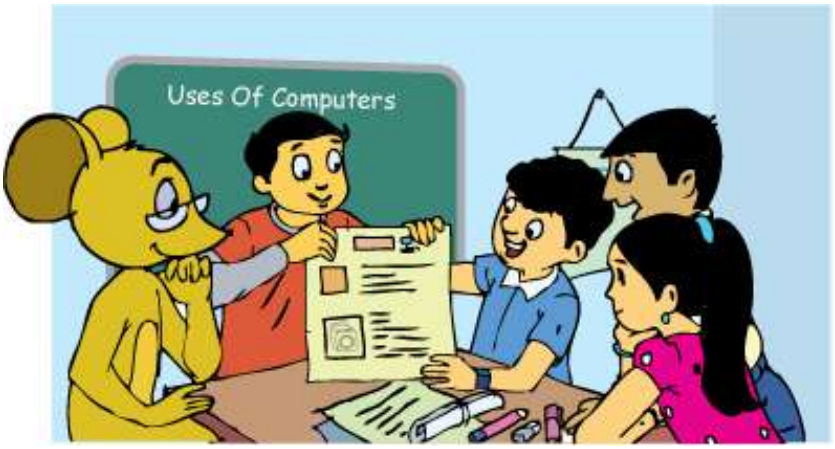
9. Uses of computer

Aim: In this lesson, you will learn:

Categorize the various uses of computers.

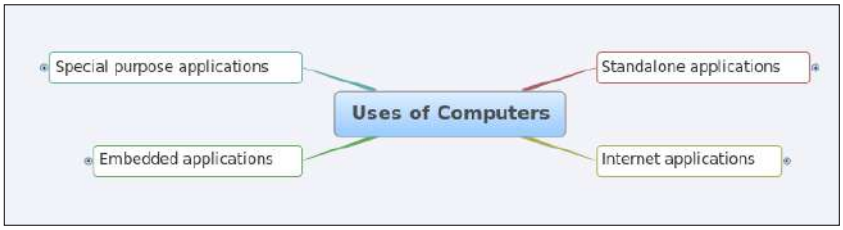
About computer usage in different fields and products.



Tejas and Jyoti have collected information about various uses of a computer. They are enthusiastically discussing with Moz.

Tejas: While gathering info we found that there are many types of computers. We also found that some applications such as, email need internet, while others such as paint can be used independently.

Jyoti: There are, some applications which are used to control devices such as washing machines, and some applications which are used for special purposes such as weather forecasting. Based on these relationships we have drawn a mind map and have come up with the four categories.



Moz: Well done. I see that you have grouped the gathered information on 'Uses of computer', neatly into four categories.

Tejas: Our teachers helped us to identify suitable names for these categories.

Jyoti: But this is only one way of categorization. My friends have created different categories and also represented it differently. We will show their work after we describe our work.

Moz: Ok, tell me more about how you categorized the information.

Jyoti: In our school, some of the computers do not have Internet. So we first listed activities which can be done even without Internet connectivity.

Tejas: For example, if we have to write text documents, paint, or play some educational games, we do not need Internet. That means applications such as open office (word processor), Tux paint (paint), and Gcompris (games), can be used without an Internet connection. Our teacher told us that such applications are called *Standalone applications*, because these applications can run on their own independently (alone) on a desktop.

Jyoti: Next we grouped the activities that need Internet connection. This category includes uses such as communicating (e-mail) or browsing, searching the Internet. The label for this category is *Internet applications*.

Jyoti: We learnt that devices like smart phones, digital camera, robots and some toys, have a small computer inside them. Our teacher told us that such applications which are used in other devices are called *embedded applications*. A small computer with the application is embedded (put into) the device.

Tejas: We also found, there are special computers and software that are used for specific purposes like defence, space and medical tests. We grouped these uses under Special purpose applications.

Moz: Good. Your categorization is based on, types of applications and the purpose of these applications. Now let us expand the mind map for each of the categories.

Jyoti and Tejas: Now let us discuss each category in detail.

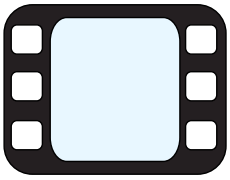
Category 1: Standalone applications.

Jyoti: *Office applications* are used to write documents, reports and make presentations. For example Open office writer and MS word are used for documents. We can save our documents on the computer and retrieve and edit them. The file extensions for Open office document is '.odt' and for MS word is '.doc'. We learnt these in Level IV. We can install and use these applications on a computer without internet connectivity.

Tejas: *Multimedia applications* that are installed on the desktop can be used to edit videos, music, make animations and presentations.

Moz: Why are the applications called multimedia applications?

Tejas: Video has sound and moving images. Since there are more than one media, and there is movement in the applications, these are called multimedia applications.



Moz: Right. Did you use any of these applications?

Tejas: I took a video of my pet. I loaded the video on my computer at home. Using Movie maker, I edited the video and removed parts that I did not want. I copied the video onto a CD to show to my friends.

Moz: What about *programming applications* such as Scratch? Does this also come under standalone applications?

Jyoti: Yes. Scratch is also an application which can run independently on a desktop. After Scratch is installed on a computer, we can create many programs like animations, stories, quizzes, games using Scratch blocks.

Moz: Are there some other uses you can recall which do not involve the use of Internet?

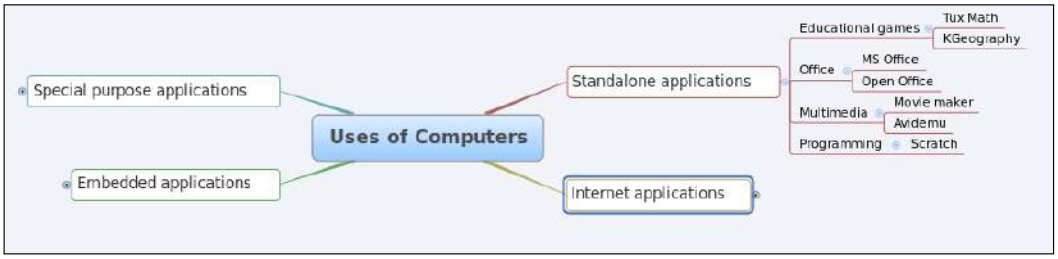
Tejas: Our teacher sometimes asks us to play educational games on Maths, Science, Geography and English. These games are available on our school computer and we do not need internet connectivity to play these games. Therefore, educational games applications that are available on desktop also belong to this category.

Moz: To summarize, all the applications that do not require Internet connectivity and can run independently on a desktop, can be grouped together in a category labelled Standalone Applications. Some examples of such applications are office, multimedia, programming and educational games.

Concept

Standalone applications:

- A computer which can be used without a network connection is called a standalone computer system.
- The applications and programs that can be installed and used even on such a system are called standalone computer applications.



Examples of Category 1: Standalone applications.

Applications	Nature of use	Name of application
Office	Writing documents, doing calculations, preparing presentations,	Open Office (http://www.openoffice.org) Xmind for mindmapping and brainstorming (http://www.xmind.net)
Multimedia	Drawing and painting, listening to music, composing music, editing photographs and videos, view documentaries, educational CDs	Audacity (audacity.sourceforge.net) Avidemux for video editing (http://fixounet.free.fr/avidemux)
Programming	Write programs using software	Scratch (http://scratch.mit.edu) Alice a 3D programming language (http://www.alice.org)
Educational games	Practice and test of knowledge of other subjects	Kbruch, Tux math Kgeography (http://edu.kde.org)

Moz: Does every desktop computer always have all the applications that you have listed under standalone applications?
Tejas: I do not think so. I observed that some of the applications on the school computer are not available on my home computer.
Moz: Yes. A desktop will have some common applications, like text editor installed (by default which means that application need not be downloaded and installed specifically) automatically. . If we want other applications beyond these, they have to be installed additionally on the computer.
Jyoti: I can request my parents to install all the educational games available on the school computer on my home computer as well.
Moz: You can search on the Internet and find these applications and their installation guidelines. For example, you can go to website- http://scratch.mit.edu/ to download and install Scratch. Note that you need internet only to download these applications. These applications can be run in standalone manner.

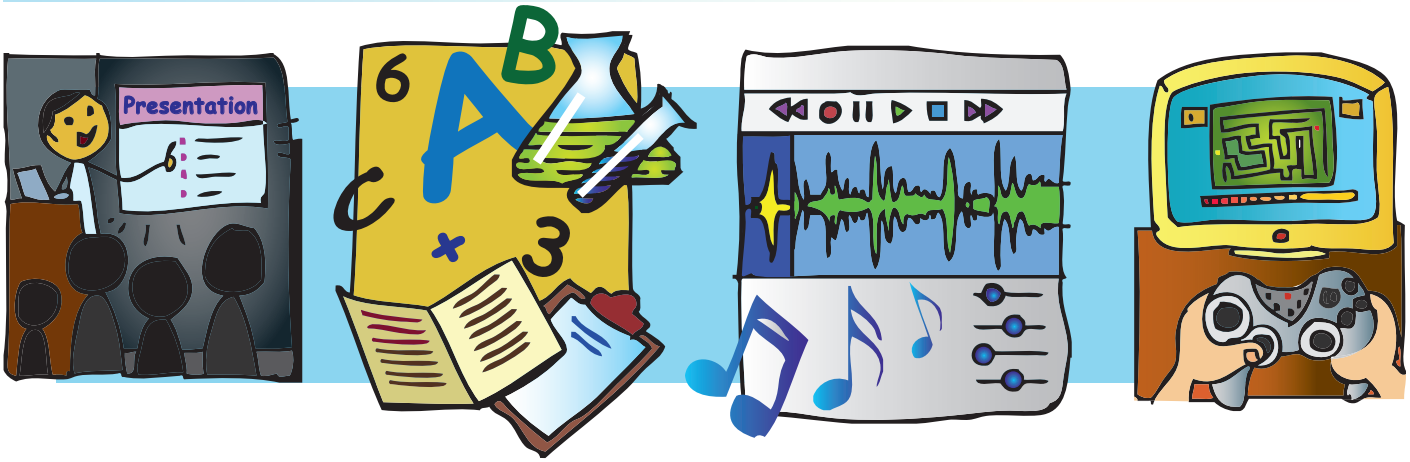
Info

Downloading application from Internet

Many useful applications are available free of cost on the Internet. The software can be downloaded from the Internet and installed on the desktop and used.
Some useful links for finding free education applications are:

- Open source and free software for school environment: http://www.schoolforge.net/
- Open source applications (example: Ubuntu operating system, blender) http://sourceforge.net

Some examples of Standalone applications



Category 2: Internet applications

Tejas: We need internet connectivity to check our emails. Gmail, yahoo, rediff mail, aol are some of the email service providers. We can get an email account with any of the email service providers and communicate with our friends and family.
Jyoti: I talk to my cousins staying in different cities using skype. Some applications like chat and skype can also be used for video conferencing.
Moz: Yes. There are various modes of communicating like email, video conferencing, chat, on the internet. Using chat one can talk to a person using text, audio or video. Internet is widely used for *communication*.

Tejas: We can find information on various topics on the internet using search engines like google, ask jeeves, yahoo, ...
Jyoti: Using appropriate keywords in the search engines, we can find information quickly and conveniently.
Tejas: We can even search for current news, weather, recipes, tourist places, maps of places and more such topics.
Moz: Yes. Browsing and searching for information is used extensively on internet for various purposes.

Jyoti: We can buy books, tickets (Example: railway tickets from www.irctc.co.in) and products ranging from clothes to musical instruments on the internet from some websites. These are delivered to the address that we give sometimes within 24 hours.
Tejas: Yes. I recall that I wanted to read a book which was unavailable in our library and local book shop. My parents searched and purchased the book from an Internet site flipkart which sells books.

Jyoti: One of my uncles sent me a gift for my birthday. He ordered the gift from the Internet and asked them to deliver it to me at my home.

Moz: Making online purchase of goods and payment is called *online transactions*.

Jyoti: I have seen websites such as oscar.iitb.ac.in, www.attanolearn.com, where the lessons in our school textbook are explained with some animations. This site also evaluates if we have understood the lesson. Many more other topics can also be learnt from such web sites.

Google earth

Moz: Internet is a good place for educating yourself about many topics. There are also some sites where you can read books

Jyoti: Using google earth which is an application that can be downloaded from google, we can see maps, see monuments in 3D. We can see Mount everest, and we can even see the sky, some stars and galaxies like Andromeda galaxy. This makes it very interesting to learn about various continents, the stars, planets and galaxies.

Tejas: At home we watch cricket, football online during the weekends.

Jyoti: On you tube we can watch magic, movies, dance, music videos. There are some very good ones. My grandparents listen to classical music on youtube. Yesterday they were listening to Mrs. Subbalakshmi and Pandit Jasraj.

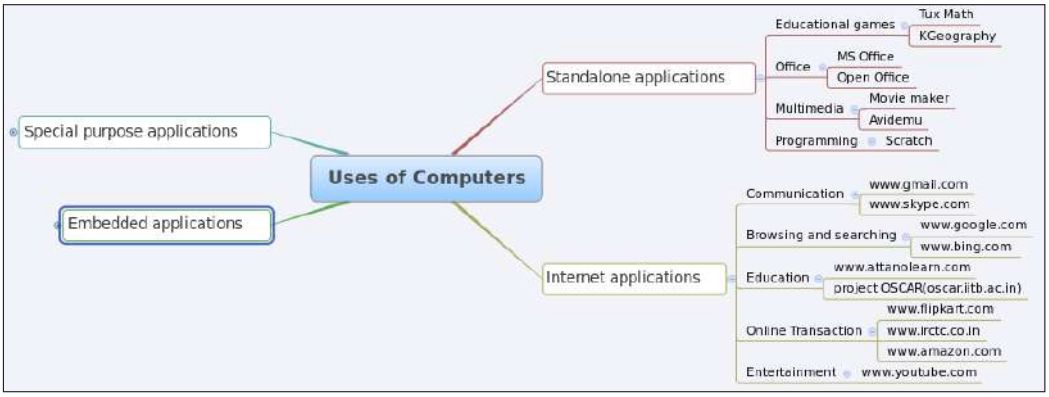
Tejas: Along with educational games, we also enjoy playing games for fun. I find these online. All these activities can be categorised as *entertainment* using the Internet.

Moz: To summarize, all applications that require Internet connectivity can be grouped together in a category labelled *Internet applications*. Some examples of such applications are communication, browsing, online transaction, education and entertainment.

Concept

Internet applications:

Applications which require internet connectivity are called internet applications.
Some internet applications, such as search, can be accessed by simply using a browser.
Others, like video conferencing require software to be downloaded on the desktop.
Some internet applications, such as transactions, require registration before using them online.



Purpose	Nature of use	Name of application
Communication	Sending e-mail, instant messaging	www.gmail.com http://www.skype.com
Browsing	Searching for information, reading newspapers, exploring the world, galaxy	www.google.com http://www.bing.com www.blackle.com http://www.google.com/earth
Transaction	Booking tickets, ATM machines, purchasing books	www.amazon.com www.irctc.com www.flipkart.com
Education	Reading e-books, viewing animations, educational videos, use online editable map	http://www.readbookonline.net/ http://www.edheads.org http://wikimapia.org/ http://www.gutenberg.org
Entertainment	Watch movies, play games, listen to music	http://www.youtube.com/

Tejas: There are some places like airports, some hotels, railway station where we can connect to internet using a mobile, laptop. How is this possible?
Moz: These places have a wireless network device mounted on the wall, which provides internet connectivity within a limited area around it.
Jyoti: In our school there is a point on the wall, to which a cable from our computer is connected.

Moz: This is called a wired connection. Nowadays you also get a network connection on wireless USB (looks like a pen drive). Connecting this device to a laptop or a computer also provides internet connectivity.

Info

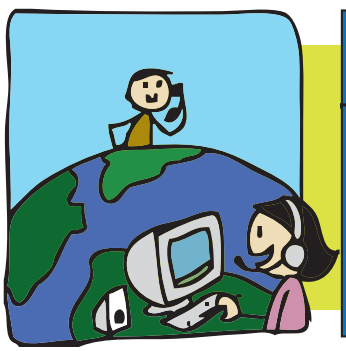
Internet: Types of connections

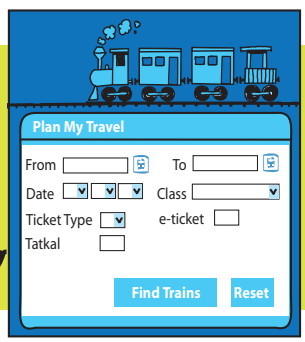
There are two ways by which we can connect to the internet.

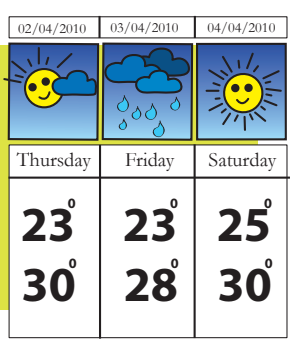
- Wired
- Wireless. (a wireless node in the vicinity or a wireless USB device)

Connection to internet is similar to telephone or mobile. One has to subscribe and pay bills for using internet.

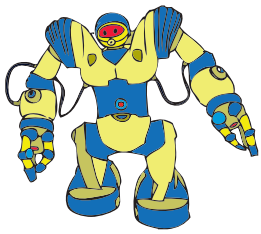
Some examples of Internet applications







Category 3: Embedded Applications



Tejas: I have seen my father use a cell phone to send e-mails. I think some phones can also be used as a computer. Can we use this embedded computer for other purposes?

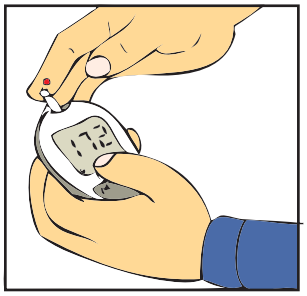
Moz: The term embedded means that the computer is installed inside the device. A small computer is *embedded (*put into) as part of a complete device, to perform one or a few specific functions related to that device. This computer cannot be programmed or used to do any other task, excepting performing the functions related to that device.

Jyoti: Now I understand that several appliances such as digital camera, DVD players, and videogame consoles and robots, have embedded computers.

Tejas: I have seen my mother use a credit card to make payments in shops. Is that also an embedded computer?

Moz: Most credit cards have a magnetic strip to record info. The credit card machine connects to your bank computer to authorize and pay. Some cards, called Smart cards have a small chip embedded that stores and authenticates data. For example, a Bus pass has details of a person, details of the routes where the person can use the bus pass, and the valid date till which the person can travel on the pass. The smart card can also have the photograph of the person.

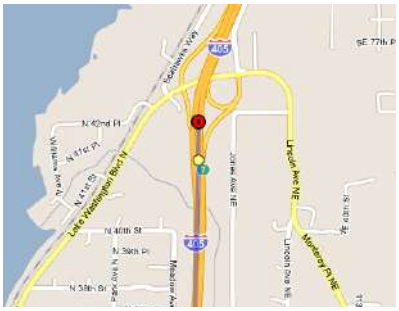
Moz: Can you think of more places where embedded computers are used?



Tejas: There are some devices which can record blood glucose levels at home for those who are diabetic.

Moz: There are many such Self diagnostic testing devices which are useful embedded applications.

Jyoti: I have seen my brother use a kit and build a robot in his college. The robot is helping the college clean the campus.



GPS Tracking

Tejas: When we travel to new locations, my parents carry a device that shows directions to drive to the destination.

Jyoti: Our teacher used her cell phone for getting location details while we went trekking. The teacher said it is called global positioning system (GPS).

Tejas: We can also find directions to someone whom we want to visit using GPS.

Moz: GPS is a very useful application. You get the details of the location wherever you are, and also provide you directions to other locations.

Jyoti: I have seen a hand held device called Kindle. We can read books, magazines, news on this device. It is wireless. We can buy and download electronic books on to the device and read.

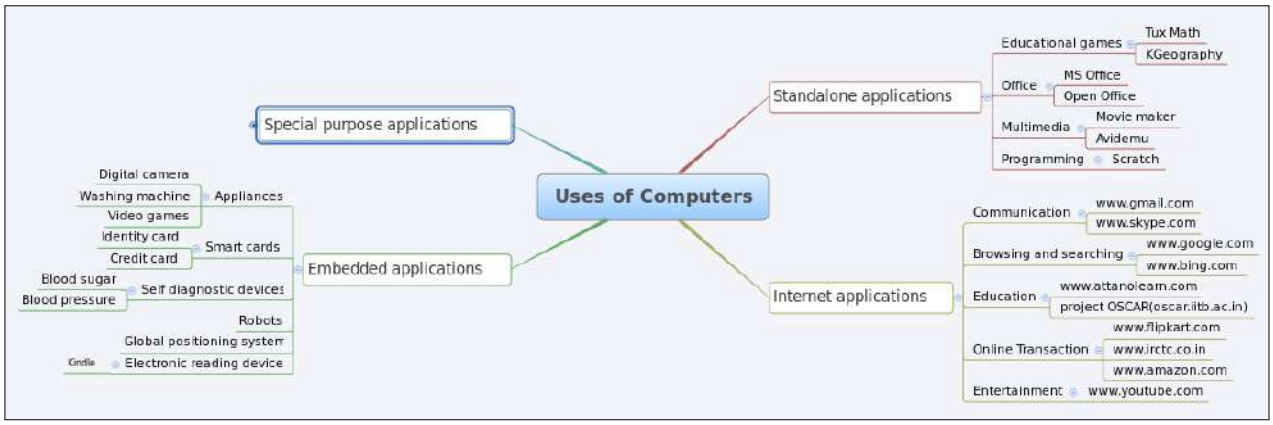
Jyoti: Oh! A toy car that moves when we make sound must be having sensors to catch the sound and then take the action.

Moz: You are right. To summarize, applications which are embedded into a device and perform specific functions have been categorized as embedded applications. Some examples are household appliances, smart cards, self diagnostic devices, robots and global positioning devices, electronic reading devices.

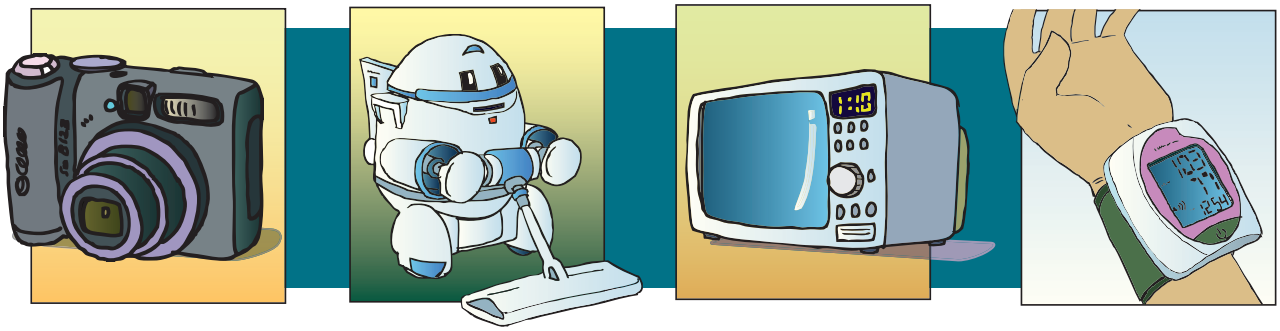
Concept

Embedded applications:

- Functions of some electronic devices are controlled by a small computer embedded in the device.
- The software on the small computer is called an embedded application.
- The embedded application can be used to control the device in which it has been embedded only.



Some examples of Embedded applications



Category 4: Special Purpose applications

Moz: I am eager to know more about the next category. How are computers used by doctors?

Tejas: We have seen medical equipment like X-Ray machines, sonography machines connected to computers.

Jyoti: These computers have applications to generate test reports which assist the doctor in diagnosing the patient's condition.

Tejas: I notice that some devices are used to record blood glucose levels at home. It seems that these are also examples of embedded application as well as special purpose applications.

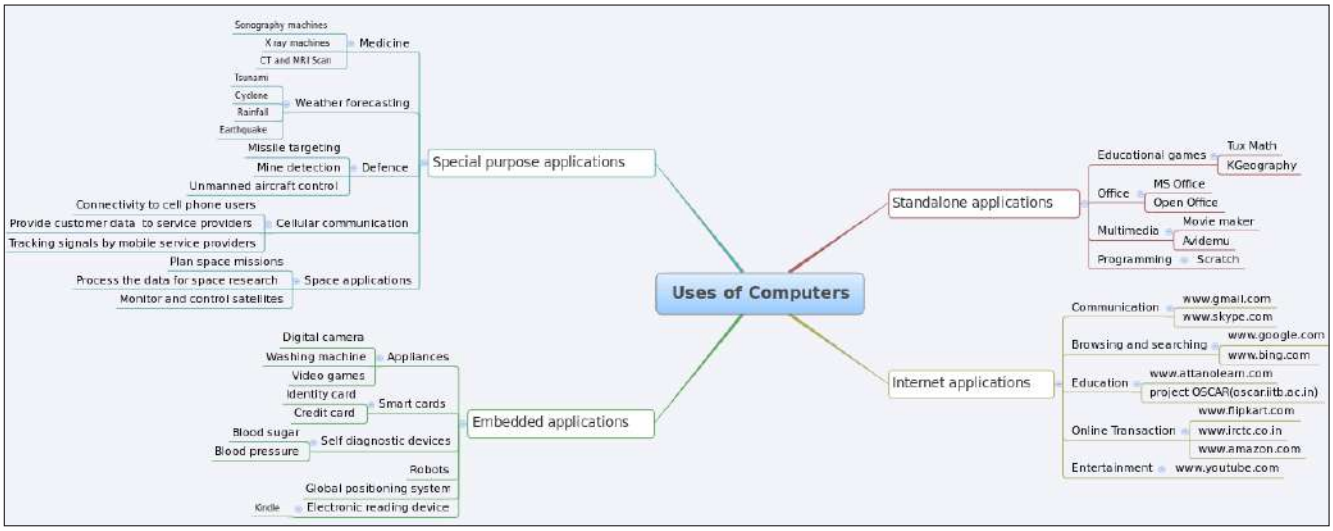
Moz: Very good. Tejas has made important observations. Many of the applications in embedded are special purpose applications as they are used for a specific purpose. One item may be in multiple categories.

Tejas: Special applications in a field like weather forecasting can be very useful to give timely warnings. This can avoid loss of human lives by taking proper precautions.

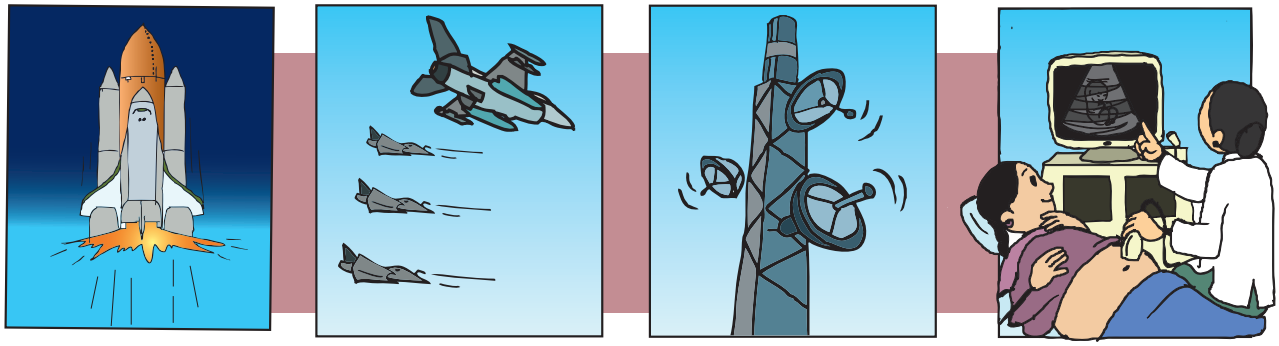
Moz: Can you think of more fields for which specific applications are developed?

Tejas: I have seen mobile towers at several places. These towers are used to provide us mobile phone communication. We also learnt that these towers transmit data to special applications that help mobile service providers to track mobile phone usage and record how many users are connected at any given point of time.

Moz: This is an example of cellular communication. Such applications are also special purpose applications which need specific software and infrastructure.
Jyoti: I found that space agencies also use specific applications to gather data on satellite positions.
Tejas: Space missions also use particular applications for controlling movements of the spacecraft.
Moz: To summarize, applications where data is collected from other resources, (like medical devices and satellite), for processing and providing information for further action are called special purpose applications. Some examples of special purpose applications usage are in, health care, weather, defence, cellular communication and space.



Some examples of Special purpose applications



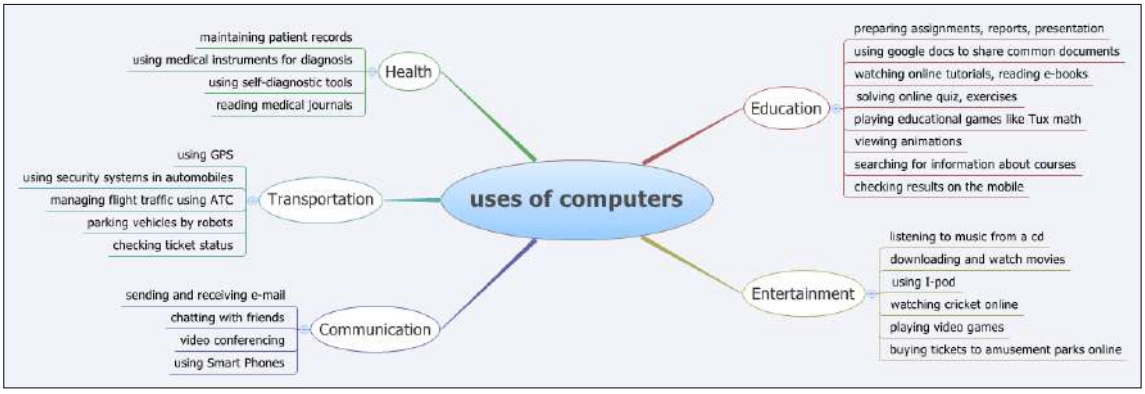
Moz: Well done. You have completed the full cycle of gathering information about uses of computer and synthesizing the information gathered.
Tejas: What does synthesizing mean?
Moz: You followed a step by step process and logical reasoning to organize the vast data that you gathered from various resources. This whole process is called Synthesizing of data or information.

Concept

Synthesis of data

1. Gathering information
2. Organizing the information by :
   i. Categorization using mind maps to find the main categories (standalone, internet, embedded and special purpose applications).
   ii. Analyzing the information to identify which information belongs to which category. (Example: Email required internet. Hence it belongs to internet applications)

Tejas: One more group has gathered information about the same topic. They have, five categories based on the purpose of use, which are, education, entertainment, communication, health, and transportation. The following mind map summarizes their categorization.



Moz: Synthesis of data by both the groups is well done. You have done the categorization using the types of applications and the purpose for which these are used. The other group has categorized the data based on the main areas (domains) in which computers are used. Both these categorizations are valid. They are correct and useful.

Tejas: We also realised that within a single classification scheme, the same item can fit into different categories.

Jyoti: We used mind maps and tables to represent our data and the other group used lists and mind maps to represent the data.

Moz: To summarize, there can be multiple categorization schemes, multiple number of categories and multiple representations for the same information.

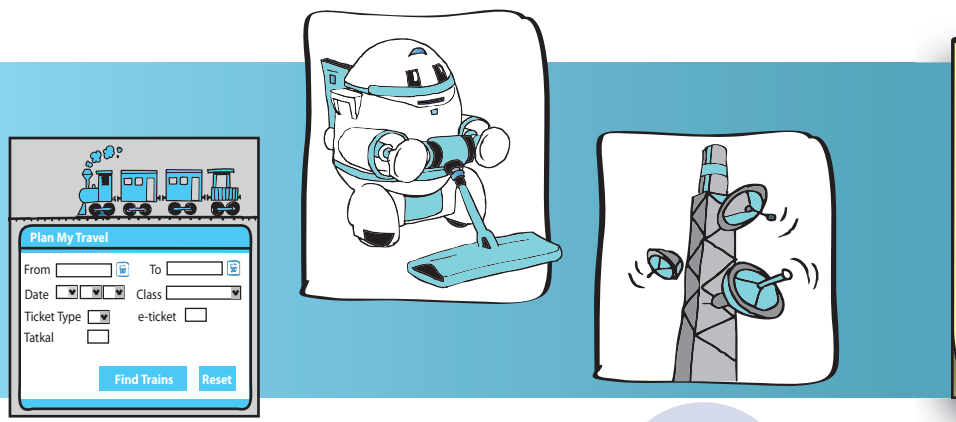
Concept

Multiple ways of categorization

- Information is grouped and categorized for better 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 for 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.

Tejas: We now have to learn how to make a presentation for this synthesized information.

Moz: We will use this synthesized information for making presentation on uses of computers. More on that in the next lesson, Chin Chinaki...

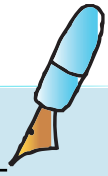


Lesson Outcome

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

- List the uses of a standalone computer, and a networked computer.
- List specialized usage of computers in particular fields.
- Identify embedded computers (in various products) and state their functions.

WORKSHEETS



1. Categorize the following uses of computers. Two labels are already filled in, fill in the third label.

Write online exams	Target missiles	Register for science Olympiad
Control unmanned aircrafts	Play TuxMath	View animations to learn fractions
Track submarines	Monitor pulse rate	Surf for information on science projects
Analyze blood samples	Keep patient records	Perform surgeries

Defence	Education	_____
Target missiles		Monitor pulse rate

2. Find the odd one out and give reasons why you think so:

i. a. Computer in robot.
b. Computer in a microwave oven.
c. Computer as a desktop.
d. Computer in a washing machine.

Reason: _____

ii. a. Missile targeting.
b. Word processing.
c. Medical imaging.
d. Weather forecast.

Reason: _____

iii. a. Facebook
b. Gmail
c. Youtube videos
d. Spreadsheets

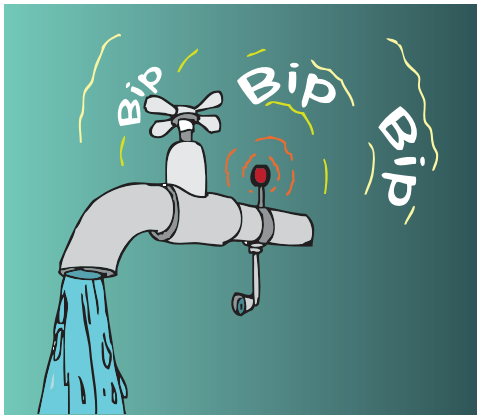
Reason: _____

iv. a. Word processing
b. Watching movies
c. Listening to music
d. Playing games

Reason: _____

WORKSHEETS

3. I AM EMBEDDED!



i. I am an embedded computer sitting on a tap. What are the different functions you want me to perform?

Example:

a. Neena forgot to turn off the knob after washing hands. So I would sound an alram "Bip, Bip, Bip" and shout "close me".

b. When the tap is turned on I will give the purity of water.

ii. I am embedded into a wall, What are the different functions you want me to perform?

a. Rekha chews pan and spit on me. So I would _____

b. _____

_____

iii. I am embedded into a identity tag. The tag is attached to a bag deposited at airport check in. What are the different functions you want me to perform?

a. Harry lost his baggage at the airport. So I would _____

b. _____

_____

iv. I am embedded into a collar of a pet. What are the different functions you want me to perform?

a. Zareen's cat, Fiona is having fever. So I would _____

b. _____

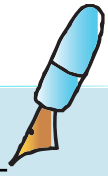
_____

v. I am embeded in a shopping cart. What are the different functions you want me to perform?

a. Suzanne has to purhcase groceries of Rs. 1000/-. She has picked up items that cross her budget. So I would _____

b. _____

_____



4. **Your friend says that there is no difference between her desktop computer and the computer inside a washing machine, as both are computers. Do you agree with your friend? Explain your reasons.**

5. **Data on the topics from in computer books from grade one to five is given. Convert it to a graphical representation.**

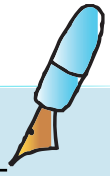
Grade	Theme		
	Familiarity with computers	**Dos and Don'ts and Ethics**	**Thinking skills**
Grade 1	Basic parts of computer	Cleanliness around the computer	Step wise thinking
Grade 2	Input , output devices	Correct postures	Logical reasoning
Grade 3	Hard copy, softcopy	Exercises to avoid injury	Algorithmic thinking
Grade 4	Storage devices	Sharing resources	Information gathering
Grade 5	History of computers	Safety rules while browsing	Decision making

6. **Frame a question.**

(In this problem, try to frame a question, which will have the answers given below).

Qns: (Ouestion can be give some examples of communication using a computer.)

a. Sending and receving emails.
b. Chatting online with friends.
c. Using video conferencing tools.



7. Given below are some examples and categories.

a. Map each example to one or more categories. Write the categories numbers next to the example. One example is filled in for you.

Category	
Communication	C1
Education	C2
Embedded	C3
Entertainment	C4
Health	C5
Internet	C6
Science	C7
Special purpose	C8
Standalone	C9
Transport	C10

S.No	Examples	Category
1	Health awareness games on the computer	c2, c4, c5, c6
2	Online ticketing for a picnic	
3	Sharing photos through email	
4	Guidelines to buy and maintain pet dog	
5	Website catalogue for ordering books	
6	Sensor embedded in clothes to monitor temperature	
7	Employee records in an office	
8	Instant messaging using mobile phone	
9	Lecture through Video conference	
10	Cooking Robot	
11	Forecast climatic conditions	
12	Monitor spacecraft movement	
13	Fill an application on the	
14	A system on a tractor to guide the farmer	

b. Select any five examples in the above list. Explain your reasons for the mapping.

1. Health awareness games on the computer: It increases knowledge hence category c2, as it is a game hence category c4, it is health awareness game hence category c5 and I play on the Internet hence category c6.

1. **Given below is a list of different kinds of books.**

   Books – autobiography, comics, current events, general knowledge, dictionary, picture book, health, spiritual, jokes, thesaurus, biography, professional, mystery and thriller, picture book, literature, nature, history, science fiction, puzzles, recipe book, technical, encyclopaedia.

   a. Give at least two different ways of categorising them.

   b. Use two different representations for showing the categorised items.

Group Activity

2. **Mehul's uncle has a sweet shop. In the festive season, he has many customers and he finds it difficult to manage the shop even with a helper. Mehul helps his uncle in the shop whenever he has time. Now his uncle wants to start using a computer to manage the day to day activities of the shop. The activities in a typical day are:**

General :

- The helper opens the shop and cleans it.
- Customers come and select the sweets.

Sales:

- Salesperson weighs the sweets.
- Salesperson puts the sweets in the bag.
- Manager collects the cash and hands over the bill and sweets.

Records:

Manager keeps record of:

- Cash transactions.
- Stock of sweets.
- Raw materials needed.

Call center:

- Get orders through the phone.
- Do home delivery of sweets.
- Occasionally, compare the prices with the current market rate and do necessary price corrections.

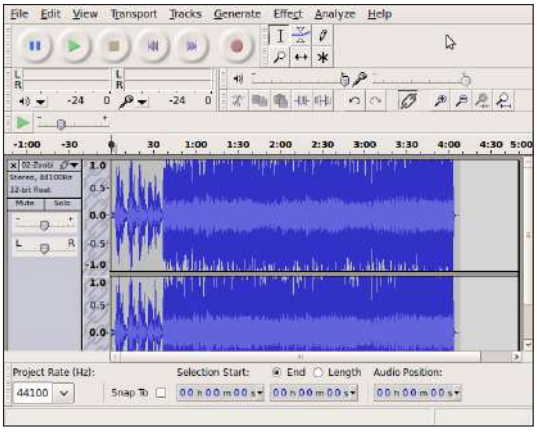
List atleast 5 activities from the above for which Mehul's uncle can use a computer. Give an example of how to use a computer for the five activities.

Activity: Helper opens the shop and cleans it. Mehul's uncle can use a cleaning robot.

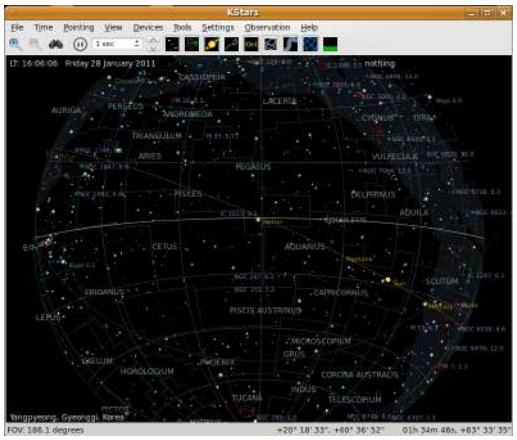
3. **Following is a list of some applications/games. Each group can select one of the following application and attempt to use it. Write a short paragraph on what is the utility of the application.**

(Hint: Click on help option and read its contents)

- ACM aerial combat simulator
- Shotwell Photomanager
- Scribus
- GIMP image editor
- Audacity
- Kstars
- Classroom control
- Homebank

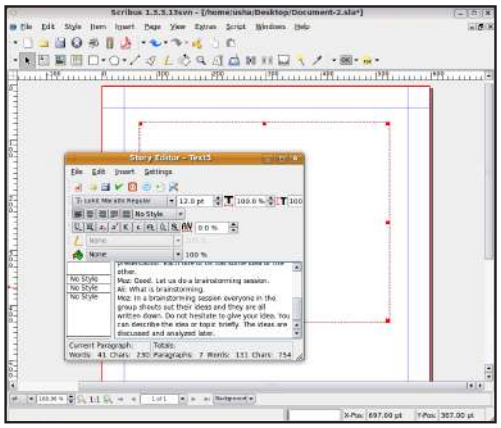


Screenshot of Audacity



Screenshot of Kstars

Screenshot of GIMP image editor



Screenshot of Scribus

Project

4. **How different is it?**

Divide the class into four groups. Each group takes up one category from the list given below.

- Personal use: Word processing, playing entertainment games, learning car driving
- Internet and Networking: Video conferencing, email, information gathering
- Special purpose applications in various fields: weather analysis, communication in defence, healthcare and service.
- Uses in other devices: remote of TV, robots used in assembling cars, mobiles

For each item in the category assigned to your group:

1. Find out how this task is/was done without computers.
2. Brainstorm about the advantages and disadvantages of this task being done with and without computers.
3. Each group enacts a skit in the class about the task, which shows how the task is done without computers and with computers, the advantages and disadvantages.

Example: Buying a railway ticket – Look up a railway timetable booklet or go to the railway station and find out about the trains, schedules. If on the date that the family decides to travel, if the tickets are not available, find out alternative dates when tickets are available, communicate the same to family, buy the tickets and come home.
With computer: Sit at home or in a cybercafe. Browse the railway ticketing site. Select and buy tickets.

1. Find software that will allow you to compose music/ edit photos/ record audio.
2. Find out different purposes for which computers can be used in a news channel .
3. Find out if computer based devices can be used to treat certain medical conditions, example: pace maker, artificial limbs.

- The purpose of this lesson is to teach students how to synthesize information and use multiple representations to showcase it. At the same time, students are educated about different uses of computers. Two alternative categorisation schemes are applied – one according to kind of computer used and another according to the purpose of use. Examples of applications for each kind are included.

- Begin the lesson with recap of the different points about uses of computer that came up during the previous brainstorming session on computers. Revise the concept of categorisation and mention that they will learn about different ways of categorisation. You can write the names of the different kinds of computers as given in the lesson. Explain what is meant by each by referring to the appropriate concept boxes. Ask them to read the table and look at the pictures for each of the category.

- Students are already aware of standalone and Internet applications. You can ask them to give examples of these categories. Students may have seen special purpose application of computers in some fields such as medicine. Ask them to describe how computers would be useful in hospitals to monitor patients. Describe the other special purpose uses mentioned in the lesson. Show the students pictures or short clips of these to facilitate understanding of how computers are used in various fields.

- To teach uses of computers in other devices, ask the students to mention the different gadgets that they have used or seen others use. Now, question them on how do you think it operates. Mobile phone and toys would be the most commonly mentioned items. Teach them about how computers are used in other devices. If possible, get one or two embedded devices to the classroom for demonstration. Do worksheet questions 1 in class and give question 2 as homework. Solve two/three questions from worksheet 3 in class and give the remaining as homework. In the next class, you can discuss the answers of students and give feedback.

- Draw attention to the overlap of one example across the different categories. Games could be the most suitable illustration for this. Give example of games that are standalone, online (Internet), or embedded (in Smart Phones). Tell them that within a single categorization scheme, one item can belong to different categories.

- Now show the graphic organiser categorisation, scheme for uses and ask them to read it. Let students figure out on what basis is this categorisation done. Most likely they will come with the right answer. Ask them to note that in the previous case, tables were used to synthesize information, while here graphic organisers are used. Teach them about multiple categorisation schemes and multiple representations. Refer the appropriate concept box in the lesson for this. Do worksheet questions 4 (grade-theme) and activity 3 in the class to further reinforce this point. You can begin solving worksheet 5 (C1,C2) and give the remaining as homework.

- End the lesson by summarizing the different uses of the computer. Ensure that you have mentioned all the uses covered in the lesson. Emphasize that this is not an exhaustive list and there are many more uses of the computer.

Further Reading: