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

Moz: I note that you have grouped the collected information on Uses of computer, neatly into four categories.

Tejas: Thanks. Our teachers helped us to identify suitable names for these categories. Here is the list of our categories.

Categories for Uses of Computer
1. Standalone applications.
2. Internet applications.
3. Special purpose applications.
4. Embedded applications.

Jyoti: But this is only one way of categorising. My friends have created different categories and also represented it differently.

Tejas and Jyoti: They have made a graphic organizer to show their categorization. We will show that after we describe our work.

Moz: 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, play some educational games, we do not need Internet for this. That means applications such as open office (word processor), Tux paint (paint), Gcompris (games) can be used without an Internet connection. We grouped such applications under Standalone applications.

Jyoti: Next we grouped the applications that need Internet connection. This category includes uses such as communicating (e-mail) or browsing for information (surfing) on Internet. The label for this category is Internet applications.
Tejas: We also found out there are special computers and software that are used for specific purposes like defence, space, medical tests. We grouped these uses under *Special purpose applications*.

Jyoti: We learnt that devices like smart phones, digital camera, robots and some toys have a small computer set inside them. Our teacher told us that such uses are embedded applications.

Moz: Good. You have analyzed and categorized very well.

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

### Category 1: Standalone applications.

Jyoti: Office applications are used to write documents, reports, make presentations.

Tejas: I use Multimedia applications to compose music, edit photographs.

Moz: What about programming applications such as Scratch?

Tejas: We can create animations after Scratch is installed on the computer. Hence, it is also a standalone computer use.

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

Jyoti: Our teacher sometimes asks us to play educational games on Maths, Science, Geography and English. These games are available on our school computer. 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 can be grouped together in a category labelled Standalone applications. Some examples of such applications are office, multimedia, programming and educational games.

<table>
<thead>
<tr>
<th>Applications</th>
<th>Nature of use</th>
<th>Name of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>Writing documents, doing calculations, preparing presentations, drawing and painting, listening to music, watching documentaries</td>
<td>Open Office</td>
</tr>
<tr>
<td>Multimedia</td>
<td>Composing music, editing photographs, creating special effects for movies, view documentaries, educational CDs</td>
<td>Audacity</td>
</tr>
<tr>
<td>Programming</td>
<td>Write programs using software</td>
<td>Scratch</td>
</tr>
<tr>
<td>Educational games</td>
<td>Practice and test of knowledge of other subjects</td>
<td>Kgeography, Kbruch, Tux math</td>
</tr>
</tbody>
</table>

Moz: Does every desktop computer 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 there on my home computer.
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: http://www.schoolforge.net/ http://sourceforge.net

Category 2: Internet applications

Tejas: We know that e-mail is used for communication.
Jyoti: I talk to my cousins staying in different cities through video conferencing.
Moz: I see that you used search engines to find information on different uses of computer. Browsing with appropriate keywords is useful to find information quickly and conveniently.
Tejas: I recall that there are websites that allow us to purchase products, tickets.
Moz: Making online purchase of goods and payment is called online transactions.
Jyoti: I found our school textbooks online. This is an education application that requires Internet.
Tejas: At home we watch cricket, football online during the weekends. This activity can also be categorised as entertainment using the Internet.
Tejas and Jyoti: Along with educational games, we also enjoy playing games for fun. I find these online. These games are categorised under entertainment.

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, transaction, education and entertainment.
Internet applications:

- Applications which are accessible from any computer with internet connectivity are called internet applications.
- A browser (ex: mozilla, Internet explorer), or a software specified by the internet application (example: skype) is necessary to access the internet applications.

### Examples of Category 2: Internet applications

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Nature of use</th>
<th>Name of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Sending e-mail, instant messaging</td>
<td>Gmail, Skype, Facebook</td>
</tr>
<tr>
<td>Browsing</td>
<td>Searching for information, reading newspapers</td>
<td>Bing, Google</td>
</tr>
<tr>
<td>Transaction</td>
<td>Booking tickets, ATM machines, purchasing books, viewing records</td>
<td>Railway website</td>
</tr>
<tr>
<td>Education</td>
<td>Reading e-books, viewing animations, educational videos</td>
<td>Oscar website</td>
</tr>
<tr>
<td>Entertainment</td>
<td>Watch movies, play games, listen to music</td>
<td>Youtube</td>
</tr>
</tbody>
</table>

### Some examples of Internet applications

![Internet applications image]

### Category 3: 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: Special applications in a field like climate 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. We learnt that these towers transmit data to special applications that help mobile service providers to track where the communication coverage is available. It can also record how many users are connected at any given point of time.
Moz: I see that cellular communication is also an example of special purpose application.
Examples of Category 3: Special purpose applications

<table>
<thead>
<tr>
<th>Domains</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>Medical equipment like stress echocardiography, CT scans, ECG and Sonography along with applications is used to diagnose patient conditions.</td>
</tr>
<tr>
<td>Climate forecasting</td>
<td>Applications are used by weather analysts to predict earthquakes, cyclones, daily weather and rains.</td>
</tr>
<tr>
<td>Defence</td>
<td>Applications used by defence personnel for missile targeting, unmanned aircrafts.</td>
</tr>
<tr>
<td>Cellular communication</td>
<td>Applications used by mobile service providers for tracking signals, customer data.</td>
</tr>
<tr>
<td>Space</td>
<td>Applications used by space agencies like NASA, ISRO for monitoring satellite data and space missions.</td>
</tr>
</tbody>
</table>

Some examples of Special purpose applications

Category 4: 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.

Moz: Yes. This is an example of embedded application. Here computers are embedded as part of a complete device to perform one or a few functions.

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

Tejas: I have seen my mother use credit card to make payments in shops. I wonder what is on the cards.

Moz: Smart cards have a small chip embedded that stores and authenticates data.
Examples of  Category 4: Embedded applications

<table>
<thead>
<tr>
<th>Applications</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appliances</td>
<td>Devices like smart phone can perform all the functions of a computer with the advantage of mobility.</td>
</tr>
<tr>
<td>Other examples include digital camera, microwave, automatic washing machine and videogame consoles.</td>
<td>Applications are used by weather analysts to predict earthquakes, cyclones, daily weather and rains.</td>
</tr>
<tr>
<td>Smart cards</td>
<td>These cards carry a chip that saves all the user data. Some examples include SIM card, identity card, credit card</td>
</tr>
<tr>
<td>Self diagnostic devices</td>
<td>Devices that record and save record of blood pressure, blood sugar levels.</td>
</tr>
<tr>
<td>Robots</td>
<td>Machine that is controlled by computer and is thus able to do tasks on its own. Some examples include robots cleaning the house, parking vehicles.</td>
</tr>
<tr>
<td>Global Positioning system (GPS) devices</td>
<td>Uses satellite data to provide location and time information at all times and everywhere. GPS devices. GPS devices can be used independently or it can be placed in automobiles or made available in cell phones.</td>
</tr>
</tbody>
</table>
Moz: Well done. Now show me the second kind of categorisation that you friends did. Tejas Jyoti shows the graphic organizers that synthesizes second kind of categorisation.

Jyoti: We have four categories created based on the kind of computers used --- standalone, Internet, special purpose and embedded applications.
Tejas: The other group has five categories based on the purpose of use ---- education, entertainment, communication, health, and transportation. The above diagram summarizes their categorization.
Moz: The two groups have come up with different schemes for categorizing the uses of computers.

Tejas: We used tables to synthesize information, while the other group used graphic organizers.
Moz: To summarize, there can be multiple categorization schemes, multiple number of categories and multiple representations.

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

---

Multiple schemes for categorization

- There is no one correct way for categorising. 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 items within the category.
- One item can belong to multiple categories
- Categorised information allows for better understanding and recall than unorganised information.
Categorised information can be represented in multiple ways. Some examples of multiple representations are lists, tables and graphic organizers.

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

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

Lesson Outcome

At the end of the 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.
1. **Categorize the following uses of computers. Two categorize are given below, fill in the third category.**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Defence</th>
<th>Education</th>
<th>___________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write online exams</td>
<td>Target missiles</td>
<td>Register for science Olympiad</td>
<td></td>
</tr>
<tr>
<td>Control unmanned aircrafts</td>
<td>Play TuxMath</td>
<td>View animations to learn fractions</td>
<td></td>
</tr>
<tr>
<td>Track submarines</td>
<td>Monitor puls rate</td>
<td>Surf for information on science projects</td>
<td></td>
</tr>
<tr>
<td>Analyze blood samples</td>
<td>Keep patient records</td>
<td>Perform surgeries</td>
<td></td>
</tr>
</tbody>
</table>

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 - 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:** ____________________________________________________________
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 the knob after washing hands. So I would sound an alarm “Bip, Bip, Bip”.
   b) I would shout "Please close me".

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 advertise ____________________________
      ____________________________
   b) ____________________________

iii) I am embedded into an identity tag given while depositing items. What are the different functions you want me to perform? 
   a) Harry lost his baggage at the airport. So I would announce ____________________________
      ____________________________
   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 lost. So I would transmit ____________________________
      ____________________________
   b) ____________________________

v) I am embedded in a shopping cart. What are the different functions you want me to perform? 
   a) Suzanne has to purchase groceries of Rs. 1000/. She has picked up items that cross her budget. 
      So I would beep and display ____________________________
      ____________________________
   b) ____________________________
4. Your friend tells 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 the reason.


5. In the following table the data on the topics covered in computer books from grade one to five is given. Convert it to a graphical representation.

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

6. Frame a question.

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

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

a. Sending and receiving 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 category. Write the category numbers next to the example. One example is filled in for you.

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Health awareness games on the computer, 1, 3, 4</td>
<td>c1, c3, c4</td>
</tr>
<tr>
<td>Education</td>
<td>Online ticketing for a picnic</td>
<td></td>
</tr>
<tr>
<td>Embedded</td>
<td>Sharing photos through email</td>
<td></td>
</tr>
<tr>
<td>Entertainment</td>
<td>Guidelines to buy and maintain pet dog</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>Website catalogue for ordering books</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>Sensor embedded in clothes to monitor temperature</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>Employee records in an office</td>
<td></td>
</tr>
<tr>
<td>Special purpose</td>
<td>Instant messaging using mobile phone</td>
<td></td>
</tr>
<tr>
<td>Standalone</td>
<td>Lecture through Video conference</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>Cooking Robot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forecast climatic conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monitor spacecraft movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fill an application on the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A system on a tractor to guide the farmer</td>
<td></td>
</tr>
</tbody>
</table>

b. Select any five examples in the above list and explain why you mapped a particular example with any of the given category.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
1. Given below is a list of different kinds of books.
   a. Present 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 in the bag.
   • Manager collects the cash and hands over the bill and sweets.

   Keep records 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 at least 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
- Kstarts
- Classroom control
- Homebank

Project

4. How different is it?

Divide the class into four groups. Each group takes up one category from the list given below: For this the teacher can use chits to distribute the categories among the groups.

- 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 of the task in the category that is 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. Then decide on which train to take. 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.

Explore

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.
Teacher’s Corner

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 categorization 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 bullets under uses of computer during the previous brainstorming session on computers. Revise the concept of categorization and mention that they will learn about different ways of categorization. You can write the names of the different kinds of computers as included 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 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 that students imagine to contain the power of a computer. 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 (on Smart Phones). Tell them that within a single categorization scheme, one item can belong to different categories.

Now show the graphic organizer with a different categorization schemes for uses and ask them to read it on their own. You can flash this on the projector and let students figure out on what basis is this categorization 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 organizers are used. Teach them about multiple categorization 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: