



## Information Processing

### Lesson Plan: Class 05 / IP / 02



<b>Overall goal of the lesson</b>	Introduction to the topic of “Information Processing”
<b>Prior knowledge required</b>	Basic concepts about comparing similar quantities and objects, natural numbers Module 1 of Class 5 of IP completed

#### MODULE 2: **Module time:** 35 minutes

<b>Goal:</b>	Emphasize the organization part of data with examples of utilizing some organizations
<b>Description:</b>	Conduct activities for generating data, processing it. Focus is maintained on sorting of data. Other forms of processing and parallels between human brain and computers is left out of the scope of this lesson
<b>Material required:</b>	<b>Physical:</b> Printed worksheets, regular writing pencils, and maybe color pencils/crayons, scratch paper (to do calculation and sorting of numbers) <b>Electronic:</b> : PPT – Information Processing
<b>Procedure Details:</b>	<ul style="list-style-type: none"><li>● Discussion on Recap:<ul style="list-style-type: none"><li>○ The teacher may choose to replay the last slide of the 1<sup>st</sup> lecture</li><li>○ Note that:<ul style="list-style-type: none"><li>▪ Each experiment we do in a lab generates data</li><li>▪ Many such experiments provide various kinds of data</li><li>▪ When it all is added together, useful information is generated</li><li>▪ This is the purpose of data/information processing</li><li>▪ It serves to further our understanding in various areas of knowledge</li></ul></li></ul></li><li>● Student list in a classroom is used as an example in following slides. They use the format known as “tables”. Table is one format of data organization, mostly used for visualization of two-dimensional data. (The organization formats are not discussed in slides and/or class, nor is the term “visualization”)</li><li>● A classroom has obviously more than 10 students, but as an example<ul style="list-style-type: none"><li>○ A classroom with 10 students is considered</li><li>○ We have a recap for the sorting exercise</li><li>○ To sort the names, we could use the first or the last name</li><li>○ Learning point:<ul style="list-style-type: none"><li>▪ The key used to organize is a choice we make</li><li>▪ It is dictated by convention or need</li></ul></li><li>○ What is the use of sorting? Or Organizing?<ul style="list-style-type: none"><li>▪ Attendance register – Document that contains all students’ names</li><li>▪ Student is identified by Roll No./First Name/Last Name</li><li>▪ Teacher can determine attendance using roll number</li><li>▪ But if the names are sorted, not knowing roll number is okay</li><li>▪ Sorting helps us think <b>less than/equal to/greater than</b> relationship</li></ul></li></ul></li><li>● Next is activity to emphasize understating what is data and what drives sorting<ul style="list-style-type: none"><li>○ We have 10 names and 4 subjects in a table</li><li>○ Unbeknown to students, they are considering two dimensions of data:<ul style="list-style-type: none"><li>▪ An array of 10 students, and</li><li>▪ 4 data points per imaginary student</li></ul></li></ul></li></ul>

- Since we will be sorting on 4 keys at a time for the rest of the lesson, ask each student to derive a (modulo 4) magic number for themselves.
- Ask students to randomly call out marks and fill the table. Do this as an open exercise so the entire class (preferably) works with same data
- Ask the students to copy that data in their worksheets
- It is okay if some students have different data on their worksheets, just that their results will vary, but be easy to manage if they do it in a participatory manner so the whole class works with identical data.
- Once they create data points ask the students what are possible things they can learn about the imaginary class? This is just a mental exercise to warm up and get them to start processing the data mentally
- Ask them to rearrange rows where marks in a designated subject are sorted highest to lowest
- Result should be a table with mixed up roll numbers, so row one does not necessarily be roll number one!
- Next (Activity #3) involves marking the same class with presence/absence
  - Mark a “P” or an “A” as appropriate
  - Expectation is the class ends up with about 3 absent students out of 10
  - Have the students create separate tables for both – absence & presence
  - Brainstorm uses of all the 3 tables, namely:
    - The original with names and marked with P/A
    - The smaller ones with only names but no P/A
    - The smaller tables are titled “Absent” and/or “Present”
    - Each is useful in its own way. Think of a purpose for each
  - The use case (purpose) dictates which table (information) is used.
    - Whether you have to submit a list of absentees to the principal
    - Or if students present in a science class are to go to a lab
  - Re-emphasize how sorting helps organize data for a purpose
- Activity #4 is a simple exercise of visualizing two tables and co-relating the information
  - We have two tables, one a class register with roll numbers, names of ten students of our hypothetical classroom
  - Another is a table that serves as a record keeping of every student’s visit to the canteen when he/she wants to buy food from the canteen
  - Since a student can forget bringing food, and have no money to buy food on that day, canteen allows students to buy the food and only records their roll number along with data and the food they bought and cost they incurred
  - The canteen supervisor sends a bill at the end of each billing period. He is not interested in remembering names.
  - The students have to create a report on who in the class spent how much in total, but include names as well.
  - This requires the students to co-relate the tables and match the roll numbers from the canteen table and the names from the class register, add up individual expenses and create a report as shown in the final table on slide #19
- The next two slides summarize the effort. It was information processing
- A summary is provided that explains the concept of processing
  - Although we did exercises in sorting, there are lot of other ways to “classify” and “process” data.
- These activities are designed extend Information Processing topic to visualize the information when it is processed, and allows us to better communicate

	<ul style="list-style-type: none"> <li>• A simple analogy between humans and computers is included for fun. Also added is a simple definition of processing and how humans and computers interact.</li> </ul>
<b>Summary</b>	<p>Summarize the learnings for the students:</p> <ol style="list-style-type: none"> <li>1. Data is simple collection of facts, like numbers, dates, and things on paper or in a computer.</li> <li>2. When we arrange them, sort it, we “process” it.</li> <li>3. When we process information, we further our knowledge</li> <li>4. We can use computers to store data and process it as we see fit</li> </ol>