REPRESENTING INFORMATION IN CODE
Lesson Plan: Class 03 / ALG / 12

Overall goal of the lesson: Children will learn about algorithms and programs

Prior knowledge required: Concepts of Algorithm and Programming (done in Std. 1, 2).

MODULE 1:
Module time: 35 minutes
Goal: To get the students to understand how an algorithm (set of steps for a task) can be defined and are required for seemingly simple tasks, when you need to guide someone else (or a machine).
To get them to then understand how the algorithm can be turned into a program.
Description: Children will learn about algorithms and programs.

Material required:
Physical:
1. One copy of the worksheet (03-ALG-12) per child.
2. Writing material to solve the worksheet: pencil and eraser.

Electronic:
PPT Presentation for PPT 03-ALG-12

Procedure Summary:
1. Distribute the worksheets (WS - class 3- P12 - Graph paper programming) to the children.
2. Read through the worksheet and discuss with the class about algorithms and programs.

Procedure Details:
1. Start the class by talking about words they have learnt earlier – Algorithm and Program – what the words mean.
2. Show a 4 by 4 graph with a * in the top left square to indicate the starting point and second square in top row & third square in the second row filled or coloured.
3. Ask them, if they had to guide their friend to make a picture like this, without showing the picture itself, how can it be done?
4. Get them to see how they could tell their friend to move from one square to next or fill colour.
5. Go through all the possible steps that can be taken on the graph, one at a time – (1). Move one square right. (2). Move one square left (3). Move one square up (4). Move one square down and (5). Fill square with colour
6. Now go back to the picture that was shown (2 painted squares and * to indicate the starting point)
7. Get the students to list out the steps to create the picture.
8. To go to the right square in the 2nd row from the coloured square in the first row, whether they move right first and then down or down first and then right, both are ways are correct. Get them to see that. But also that while giving instructions, they have to say exactly how to go (and can't say either go this way or that way).
9. Now get them to list steps to make different pictures. The first picture we saw had only 2 coloured squares. Now you can have 3 or 4 squares coloured. Ask someone to come ahead and write on the board. Others can guide that student.
10. Next step is to show them a 4 X 4 graph paper with alternate squares filled with colour – so out of 16, 8 squares will be filled.
11. List all the steps for the first two rows of this and point out how much one has to write to list all the steps when there is a lot to do.
12. Now introduce the idea of a 'code'. You can say, what if we decided that when I draw a right arrow ($\rightarrow$), it means move one square right and when I draw a left arrow ($\leftarrow$) it means move one square left. Same with an up arrow and a down arrow. And when I want to fill a square with colour I could show that by writing "C" for colour.

13. It is time to convert the steps into the code now! So what will the steps for creating the first picture look like when written in the code?
14. This now is a program written in a 'code' or 'language' we defined for it.
15. Show them the difference – how the text when written in code or with symbols becomes easier to write.
16. Discuss other examples of codes we use – Date to start with. Get them to see that representation of the date is done using a code.
17. Symbols for mathematical functions such as "+", "-" are symbols used to show well defined actions.
18. Now talk about how we can define the code whichever way we like. The arrows and "c" we used was just one code we defined. We could use other symbols for the same meaning. Letters "R", "L", "U", "D" and "P" is one more code.
    It could be different fruits representing different directions. Or something else as well. Get them to understand that it is whatever we decide upon.
19. Ask them if they can think of any other code
20. Announce that they are now going to get a chance to do some fun activity based on what they have learnt.
21. Distribute the worksheets.
22. Explain the activities to be done.

Assessment :
Answer questions on the activity sheet

Information Broadcast : In Computer Science, the children learnt about what is an algorithm and how it can be written as a program.