



Debugging

Lesson Plan: Class 03 / ALG / 16



Overall goal of the lesson: Children learn to find out what is wrong in an algorithm

- Predict where an algorithm will fail
- Modify an algorithm to solve errors
- Identify out-of-order steps
- Understand the debugging process

Prior knowledge required: Algorithms, map puzzles using Flurb and fruit

Material Required: Paper, pencil

Physical:

Electronic:

PPT – Debugging

Procedure Summary & Details:

1. Review
 - a. Revise terms
2. All the puzzles are animated – announce the Step number as you go – the animation highlights the step to be executed first and then moves Flurb.
Go slow: ask the kids where do you think Flurb will go now? And let the kids prompt you. Then move ahead.
Emphasise “stepping through” the algorithm... it is important.
 - a. Puzzle 1 – Step 4 has a wrong instruction – the children should exclaim when you reach there because they can see it is wrong. Ask the children, “Oops, was that a mistake? What should we do instead?” Try and get the correct answer out of them before moving on to the next slide.
 - b. After each puzzle go over the process of debugging as shown in Slide 6
 - c. Explain importance of debugging to make programs work correctly!
 - d. Introduce the EAT instruction make sure they’ve got the features of EAT correctly
 - e. Puzzle 2 – Step 3 is wrong – the children should exclaim when you reach there because they can see it is wrong. Try and get the correct answer out of them before moving on to the next slide.
 - f. Again go over how we debugged Puzzle 2
 - g. Puzzle 3 – it has one step missing. Stop when you reach the last step – question the children are we done? If they say yes point out that one pineapple is still remaining. Remind them of how EAT works if they still don’t get the answer. Try to get the answer from them before moving to the next slide.
 - h. Go over the debugging process for Puzzle 3
 - i. Puzzle 4 – this puzzle has an extra step – Step 7. The kids ought to exclaim when you take Step 7 – see if you can get them to correct the program before moving to the next slide.
 - j. Review how we debugged Puzzle 4

[Advanced]

- k. Review the loop instruction.
- l. Rewrite Puzzle 4 using the loop instruction.
- m. Puzzle 5 – Here, point out to the children that there’s a new element in the field – DANGER! Would you like to end up there? (NO!) So let’s see if Flurb ends up there! Step through very slowly – remember that Flurb moves multiple spaces for a single repeat instruction. Say the loop count loudly – if repeat count is 2, say 1 and then 2 out loud as Flurb moves. Ask the children at the end – What happened? Why did Flurb end up in danger?

For this puzzle, we explore the debug step before showing the solution since it is a complex bug. Try and get the children to identify how to fix the problem. Then take them through the corrected problem.

n. Recap.

3. Distribute the worksheet
4. Discuss worksheet