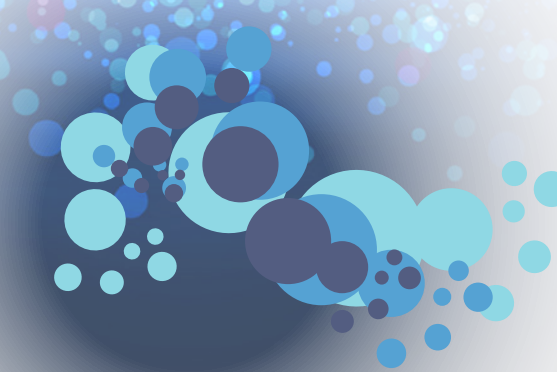


Algorithms in pseudocode and flow diagrams

Teacher's Notes

Lesson Plan

Length	60 mins	Specification Link	2.1.7/ab	Algorithms in pseudocode and flow diagrams
Learning objective	Understand algorithms written in a flow diagram or pseudocode, explain what they do, complete or correct them Produce algorithms in pseudocode or flow diagrams to solve problems			
Time (min)	Activity	Further Notes		
5	Introduction: What is an algorithm? <ul style="list-style-type: none"> Explain that an algorithm is simply a sequence of steps for completing a task. Show Screen 1 of Demonstration – cake ingredients. Explain that cooking is all about algorithms. Look at the recipe – it is a series of steps. With cakes you can see what stage you are at – what ingredients you have left, whether the cake springs back when you get it out of the oven. The big difference with computer algorithms is you can't see what's going on – you have to track the current 'state' of everything in your head. Flowcharts can help with that. 	You may add that it must be done in the correct order, and can contain loops (doing things a certain number of times or until something happens) and make decisions.		
10	<ul style="list-style-type: none"> Explain that algorithms can be represented in many ways including flow charts and pseudocode. A flowchart lets you leverage the visual part of your brain to 'see' how the algorithm functions. Show Screen 2 of Demonstration – baking cake in a flowchart. Pseudocode allows you to 'get your ideas down' as step by step code-ish statements, without getting bogged down in the specifics of a particular language's syntax. 	You could also explain that computer variables are often likened to named boxes containing a value. If they were, at least we'd be able to look inside the box to see the value. But we can't. When you're trying to understand a computer algorithm you can't see into the computer's brain to determine the current value of x, or what number is in 'secondElapsed'. Note: there are many tools available for creating flowcharts and many word processing applications have a system for creating flowchart symbols & connecting them: Flowcharts palette in OpenOffice		
5	Watch the set of videos.			
5	Check students' understanding of the video by asking for definitions of key terms such as. <ul style="list-style-type: none"> Flowchart Algorithm Pseudocode 	Flowcharts are ways of representing steps in a process visually. An algorithm is a step by step solution to a problem. Pseudocode uses the structure of a programming language, but is intended for humans, not computers, to read.		



Time (min)	Activity	Further Notes
5	Interactive activity 1 Students match the flowchart symbols to their names.	
10	Worksheet 1 Ask students to write down an algorithm for an everyday process (making tea, tying your shoelace, crossing the road) in a flowchart and/or in pseudocode.	
10	Interactive activity 2 Explain that the tool Proanimate allows you to build programs using flowcharts. The activity shows students how this works – the flowchart is built on the left and the code (Java or Visual Basic) is displayed on the right. They can then try out the tool for themselves as a follow up session.	
5	Homework Ask students to complete Worksheet 2.	
5	Plenary Class discussion of any misunderstandings, or clarifications required.	



WORKSHEET 2 ANSWERS

1 (a) A user enters £3. Explain what will happen.

The user's money is greater than £2 so the system will accept it, but the user will be given the message that they have overpaid. They will have the option to confirm or cancel.

(b) State *two* decisions which have to be made in this process.

Two from:

- Is the money less than £2?
- Does the money = £2
- Which button was pressed?

(c) A user is issued this ticket from the system:

19/07/2013 £3.00
You can park until 14.21h

State *three* facts you can work out from this ticket.

Three from:

- The date of issue of the ticket is 19th July 2013
- The user overpaid by £1
- The ticket was issued at 12.21pm