

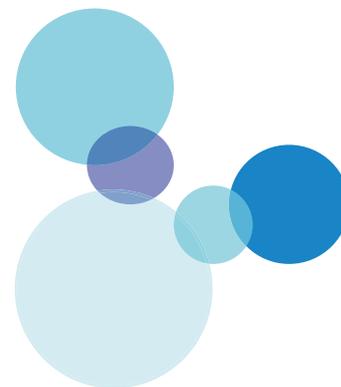
How RAM affects performance

Teacher's Notes

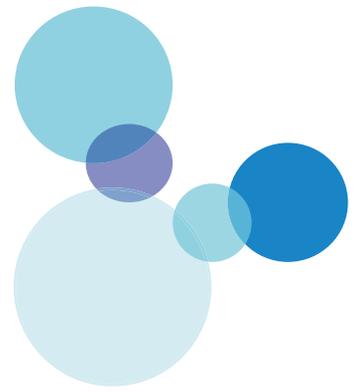


Lesson Plan

Length	60 mins	Specification Link	212/j	
Learning objective	Candidates should be able to: (j) explain how the amount of RAM in a personal computer affects the performance of the computer			
Time (min)	Activity	Further Notes		
10	<p>As there is only one learning point in this episode and as it is the last item of the sequence on RAM and ROM, part of the lesson can be used to assess and reinforce the learning of the whole sequence.</p> <p>Consequently some of the questions in Worksheet 1 and the Interactive Activity 1 refer to learning points in previous lessons, so can be used as revision.</p> <p>As revision of the previous lesson and to provide a focus for this lesson ask the students to explain the function of RAM.</p> <p>Using a projector, display the Interactive Starter Activity.</p> <p>This video uses a simple analogy to show why increasing the size of the computer's RAM will improve its performance.</p>	RAM is used to store the program instructions and data currently being used by the CPU.		
10	Watch the video, pausing to discuss the content.			
5	<p>Discuss the video to assess learning. Ask questions such as:</p> <ul style="list-style-type: none"> • Why does increasing the amount of RAM in a computer improve its performance? • The data in RAM that is least used is swapped to paging file on the hard disk drive when the RAM is full. What is this file called? • How does the amount of RAM affect the multitasking capabilities of the computer? 	<p>Answers:</p> <p>More program instructions and data can be stored and therefore there is less need to swap data back and forth between the RAM and the hard disk drive.</p> <p>Virtual memory.</p> <p>It allows the instructions from more programs to be held in RAM and so improves multitasking capabilities.</p>		
15	<p>Worksheet 1</p> <p>Students to complete Worksheet 1 either on paper or on computer. They may need access to the Internet to research some of the questions.</p> <p>Ask individual students for their answers and discuss with the class so that all students will have the correct answers.</p>	<p>Answers provided.</p> <p>Ask students with the correct responses to explain to the class how they arrived at their answers.</p>		
10	The students use Interactive Activity 1 .			



Time (min)	Activity	Further Notes
	Extension Challenge/Homework Students to complete and submit Worksheet 2 for homework.	
5	Plenary – What do I know? The students should work in pairs to write down everything they know about RAM and ROM. Get each pair to read out a different fact in turn until all facts have been stated.	



WORKSHEET 1 ANSWERS

1 (a) 'RAM' and 'ROM' are acronyms. State what the letters RAM and ROM stand for.

Random Access Memory.

Read Only Memory.

(b) State the differences between RAM and ROM.

RAM is volatile – it loses all data when the power is turned off. ROM is not volatile.

Data can be written to RAM by the computer user but ROM is read only.

(c) Explain why ROM is required by the computer.

The BIOS – **b**asic **i**nput **o**utput **s**ystem, is stored on ROM so that the computer has boot-up instructions when the power is turned on.

2 Explain the function of RAM in a computer system.

RAM is used to hold the operating system, program instructions and data currently being used by the CPU.

When a program is loaded from the hard disk drive, the program instructions are copied into RAM.

3 Explain what happens when there is not enough RAM to store all of the required data.

When the RAM is full, the operating system will 'swap out' some of the data to a file on the hard disk drive. This is referred to as 'virtual memory'.

Usually the least recently used page is swapped out.

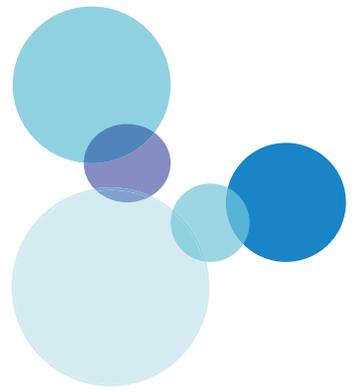
If a page is swapped out and then is referenced, it is swapped back in from the swap area, at the expense of another page.

4 Explain how inserting more RAM in a computer affects its performance.

With more RAM, more of the program instructions can be loaded and there is less need to keep swapping data in and out to the swap file on the hard disk drive.

The constant swapping of data slows down the speed at which applications can run, so increasing RAM will increase the speed of operation of the computer.

An increase in RAM will improve the multitasking capabilities of the computer as the instructions of several programs will be able to be stored in RAM at the same time.



WORKSHEET 2 ANSWERS

1 Explain how increasing the amount of RAM in a computer affects its performance.

If there is more RAM then more program instructions and data can be stored.

The programs will run faster as there will be less use of virtual memory.

The computer will be able to multitask more programs.

(1 mark for each point)