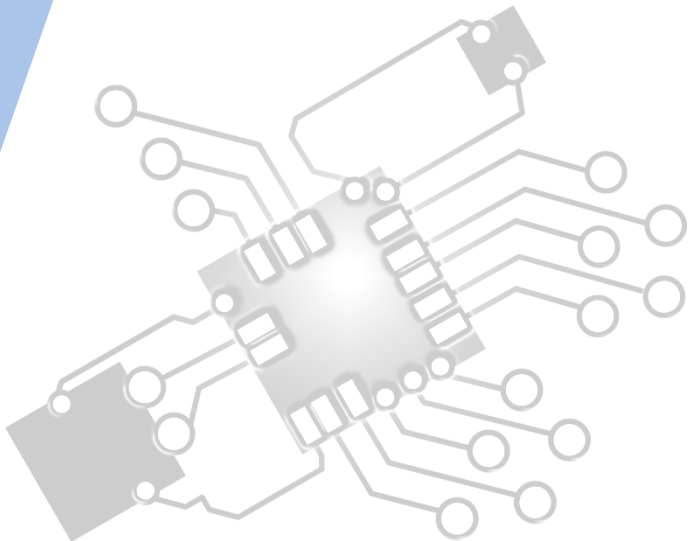




Resource Management

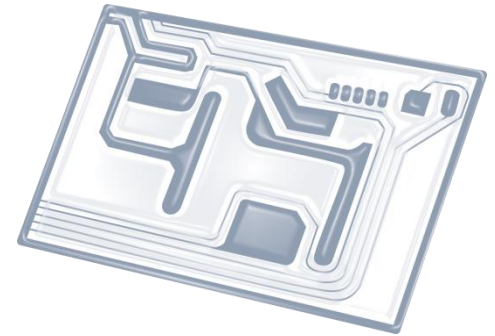
IB Computer Science



Content developed by
Dartford Grammar School
Computer Science Department



HL Topics 1-7, D1-4



1: System design



2: Computer Organisation



3: Networks



4: Computational thinking



5: Abstract data structures



6: Resource management



7: Control



D: OOP

HL *only* 6 Overview

System resources

6.1.1 Identify the resources that need to be managed within a computer system

6.1.2 Evaluate the resources available in a variety of computer systems

6.1.3 Identify the limitations of a range of resources in a specified computer system

6.1.4 Describe the possible problems resulting from the limitations in the resources in a computer system

Role of the operating system

6.1.5 Explain the role of the operating system in terms of managing memory, peripherals and hardware interfaces

6.1.7 Outline OS resource management techniques: scheduling, policies, multitasking, virtual memory, paging, interrupt, polling

6.1.8 Discuss the advantages of producing a dedicated operating system for a device

6.1.9 Outline how an operating system hides the complexity of the hardware from users and applications



1: System design

2: Computer Organisation



3: Networks

4: Computational thinking



5: Abstract data structures

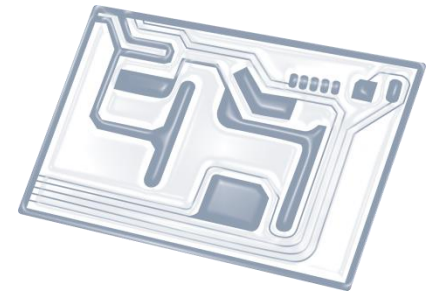
6: Resource management



7: Control

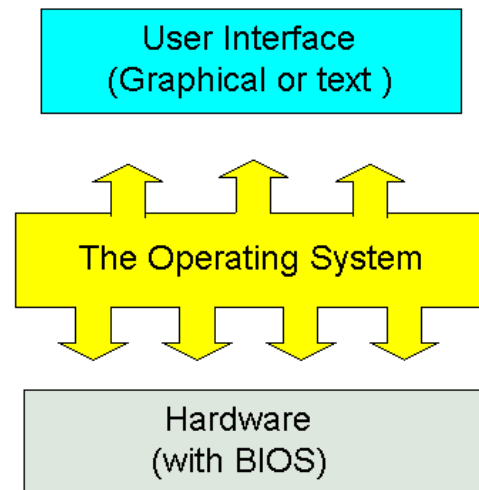
D: OOP





Topic 6.1.9

Outline **how** an operating system **hides** the **complexity** of the hardware from users and applications



Teacher's note

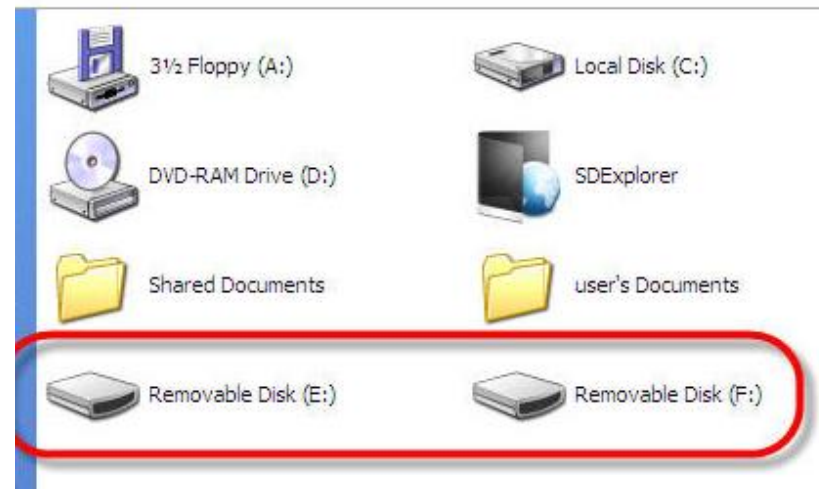
- *Students should be aware of a range of examples where operating systems virtualize real devices, such as drive letters, virtual memory, input devices, the Java virtual machine.*
- *The issue of localization causing compatibility problems between systems in different countries is also important.*

Abstraction leads to simplicity

- Users and applications do not see the hardware directly, but view it through the OS.
- This is used to hide certain hardware details from users and applications (called **abstraction**).
- Due to this **abstraction**, users cannot see changes in the hardware. Can be used is to make related devices appear the same from the user's point of view.
- *For example*, hard disks, floppy disks, CD-ROMs, and USB keys are all very different media, but in many OSes they appear the same to the user.

Drive letters

- A **'drive letter;** is a single alphabetic character A through Z that has been assigned to a physical drive or drive partition in the computer.
- For example, a computer with a floppy drive has a drive letter of **A:** assigned to the drive.
- All computers with a hard drive will always have that default hard drive assigned to a **C:** drive letter
- CD-ROM or other drive is the next drive letter (e.g. **D:**) etc.



Java Virtual Machine

- A Java virtual machine (JVM) interprets compiled Java binary code (called *bytecode*) for a computer's processor (or "hardware platform") so that it can perform a Java program's instructions.
- Each platform gets its own JVM so that Java code can run on any platform.

