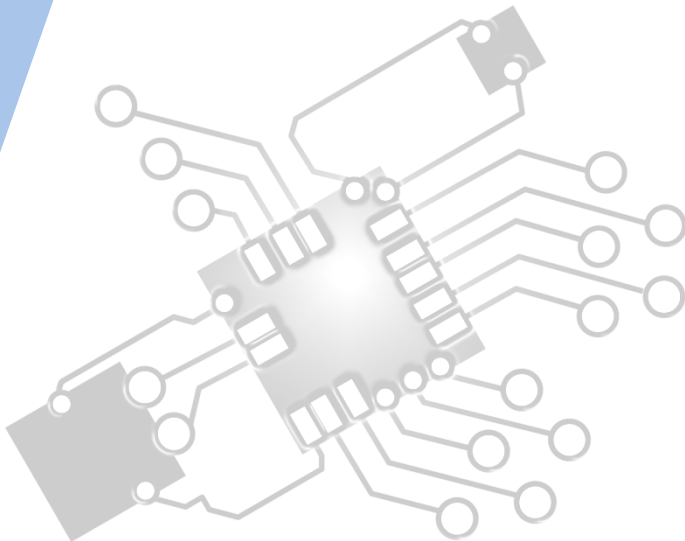




# *Network fundamentals*

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 & SL 3 Overview

## Network fundamentals

- 3.1.1 Identify different types of networks
- 3.1.2 Outline the importance of standards in the construction of networks
- 3.1.3 Describe how communication over networks is broken down into different layers
- 3.1.4 Identify the technologies required to provide a VPN
- 3.1.5 Evaluate the use of a VPN

## Data transmission

- 3.1.6 Define the terms: protocol, data packet
- 3.1.7 Explain why protocols are necessary
- 3.1.8 Explain why the speed of data transmission across a network can vary
- 3.1.9 Explain why compression of data is often necessary when transmitting across a network
- 3.1.10 Outline the characteristics of different transmission media
- 3.1.11 Explain how data is transmitted by packet switching

## Wireless networking

- 3.1.12 Outline the advantages and disadvantages of wireless networks
- 3.1.13 Describe the hardware and software components of a wireless network
- 3.1.14 Describe the characteristics of wireless networks
- 3.1.15 Describe the different methods of network security
- 3.1.16 Evaluate the advantages and disadvantages of each method of network security



1: System design

2: Computer Organisation



3: Networks

4: Computational thinking



5: Abstract data structures

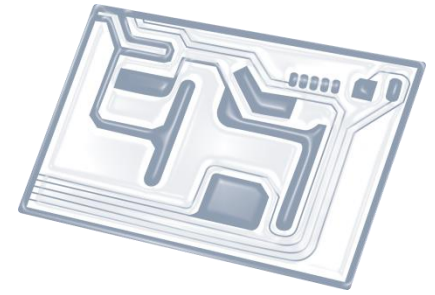
6: Resource management



7: Control

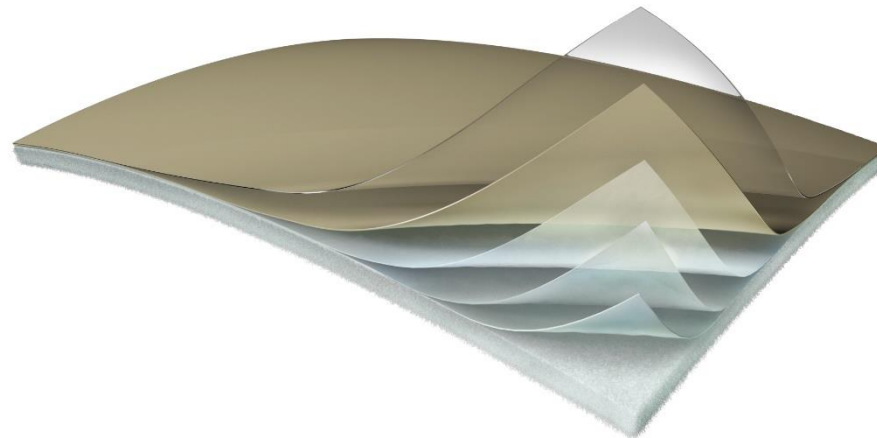
D: OOP





# Topic 3.1.3

Describe how **communication** over networks is **broken down** into **different layers**





## Exam note!

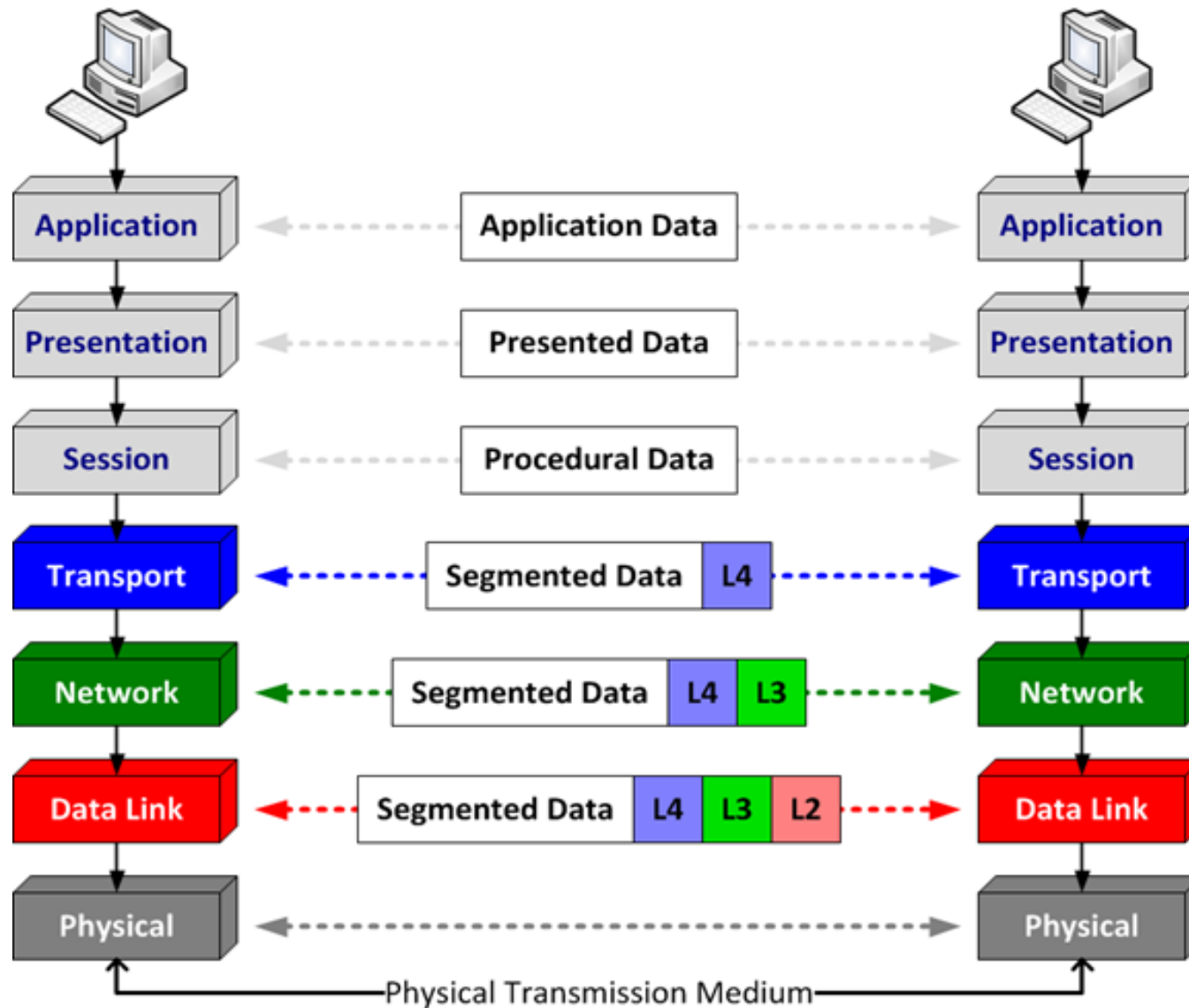
This curriculum point requires you to have an **awareness** of the seven-layer OSI-model, but an understanding of the **functioning** of each layer is not required.



## OSI Model

APPLICATION HTTP, SNMP, FTP	Interface for end point service Examples are web browsing and email
PRESENTATION WMV, JPEG, PNG	Formats application data for delivery Examples are compression and encryption
SESSION Connection Management	Manages sessions between application process
TRANSPORT TCP, UDP	Host to host communications Segments and Diagrams
NETWORK IP	Source and destination IP addresses <a href="http://www.google.com">www.google.com</a> = IP address Packets
DATA LINK MAC, FCS	Source and destination MAC addresses Ethernet Frames
PHYSICAL Data Encoding	Physical media Layer 1





# L A Y E R S

# Simplified **TCP/IP** Model

