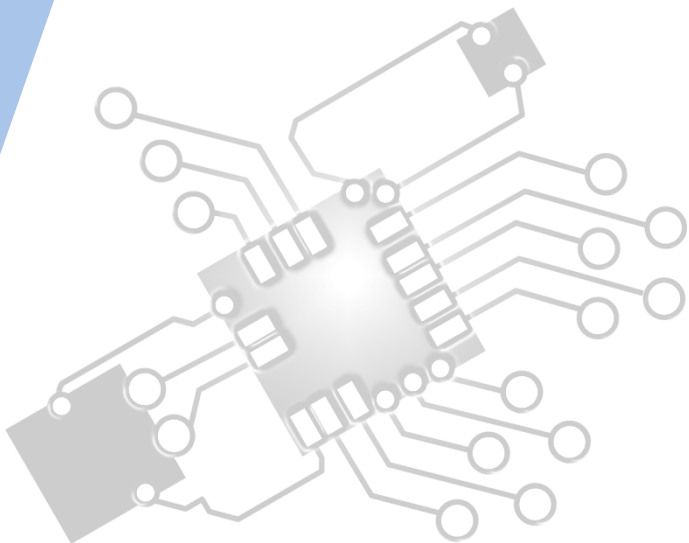




Planning & system installation

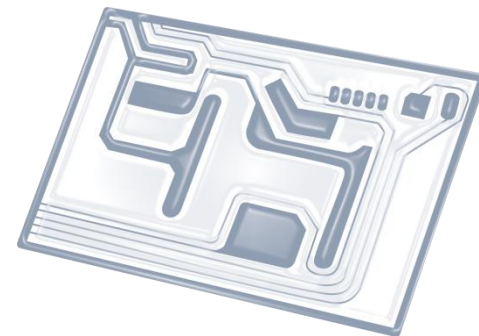
IB Computer Science



*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

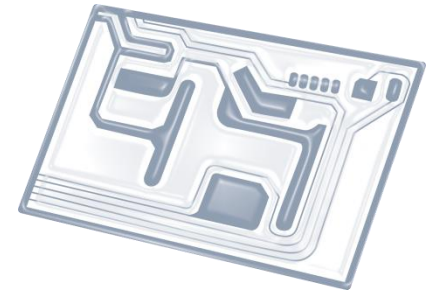


7: Control

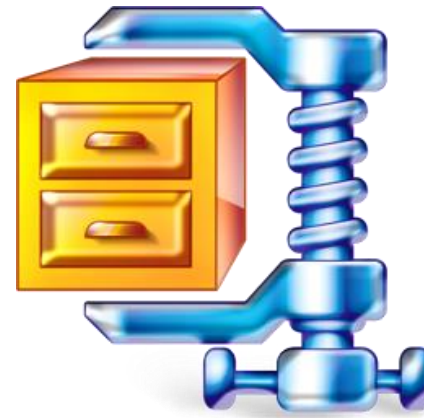
D: OOP



Topic 3.1.9

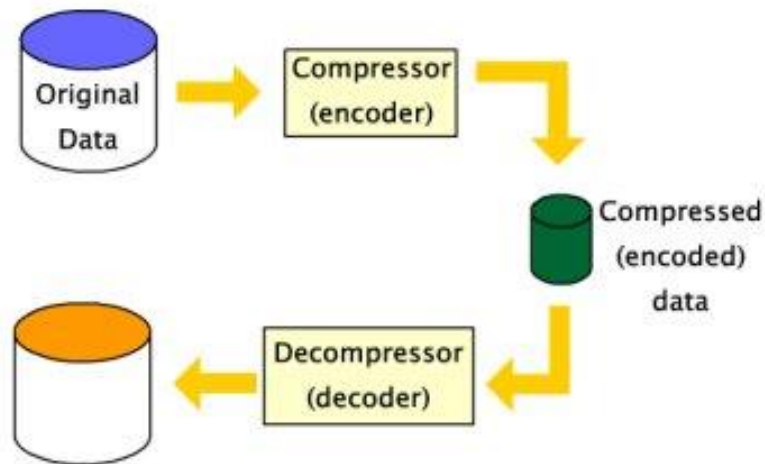


Explain **why** compression of data is often necessary when transmitting across a network



Definition: **Compression**

Data compression involves encoding information using fewer bits than the original representation.



Why bother?

Backups/archiving

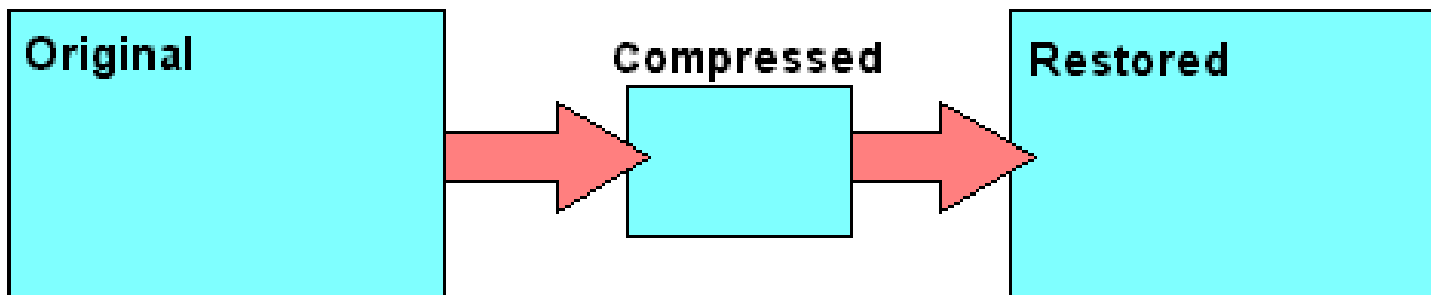
**Encryption/
protection**

File transfer

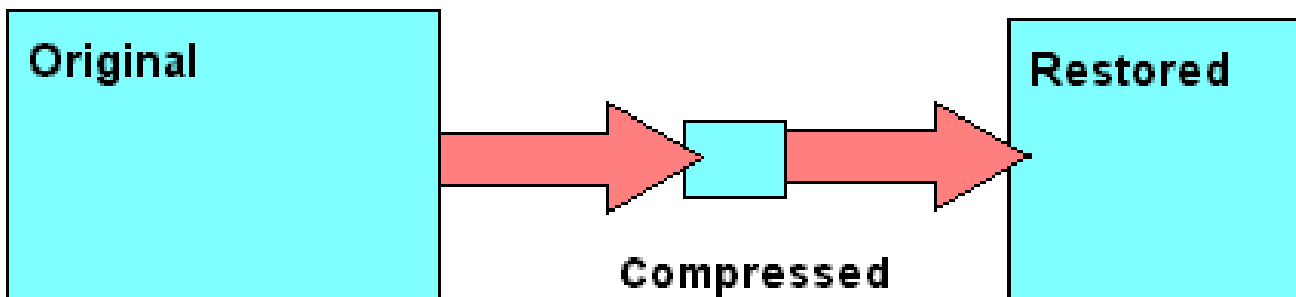
**Media file transfer
over the web**

Lossy vs Lossless Compression

LOSSLESS



LOSSY



<http://www.youtube.com/watch?v=2Qo5prktYNQ>

Common compression file types

Lossy

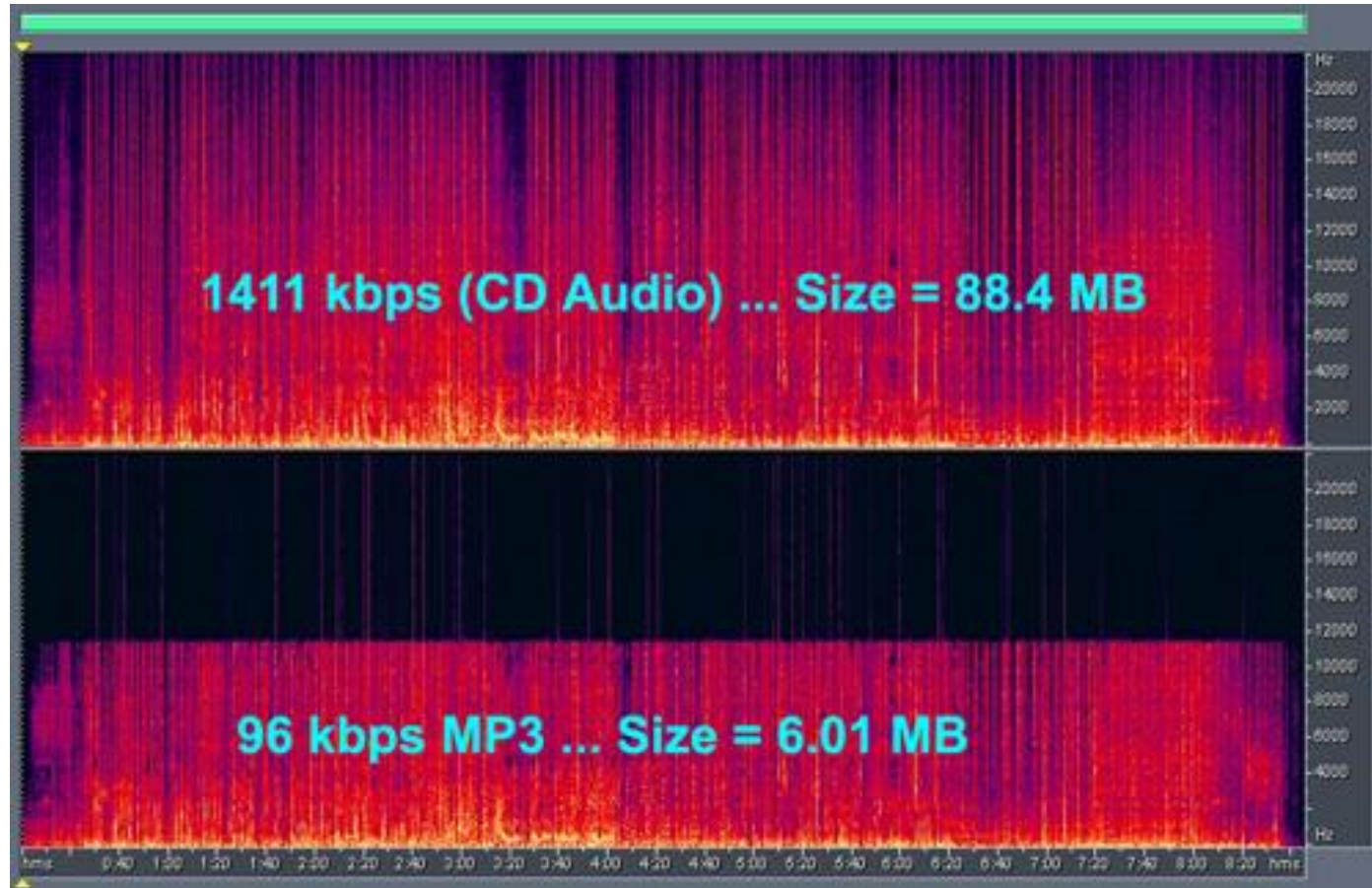
PGF
JPEG
JPEG 2000 *
JPEG XR *
MP2
MP3
MP4
WMA

Lossless

PNG
GIF *
TIFF
ZIP



Audio Example: **WAV** vs **MP3**



Images

Low res images become pixelated when zoomed in

