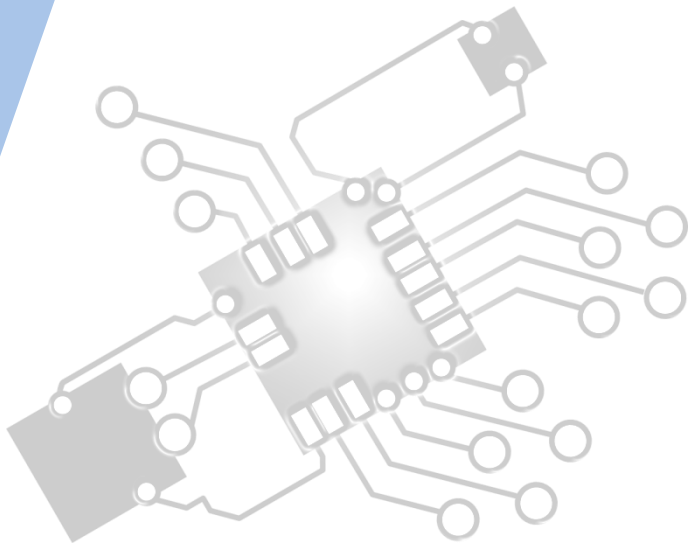
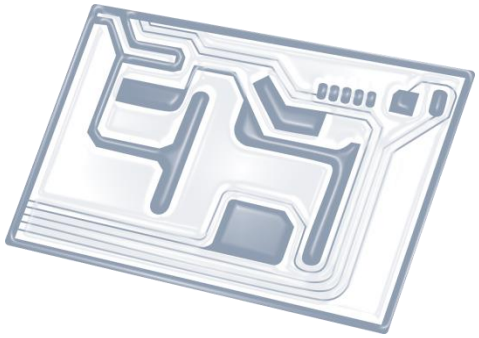
Data transmission

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

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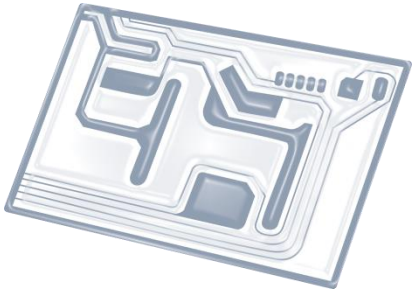
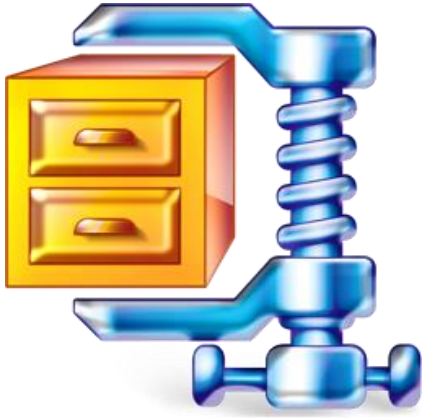


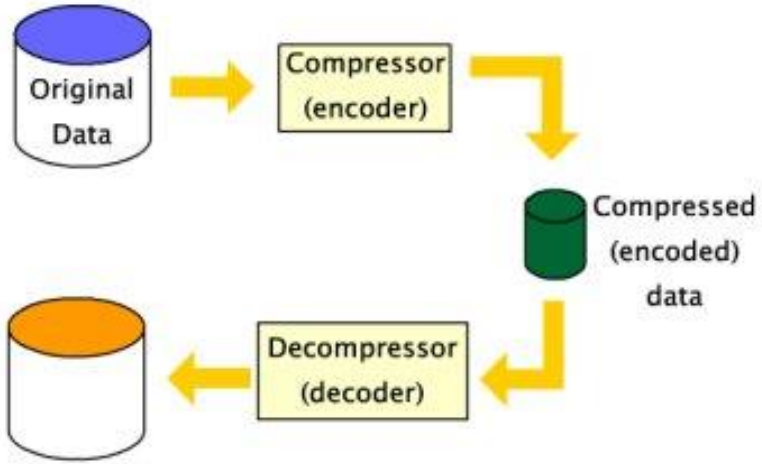
Topic 3.1.9

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



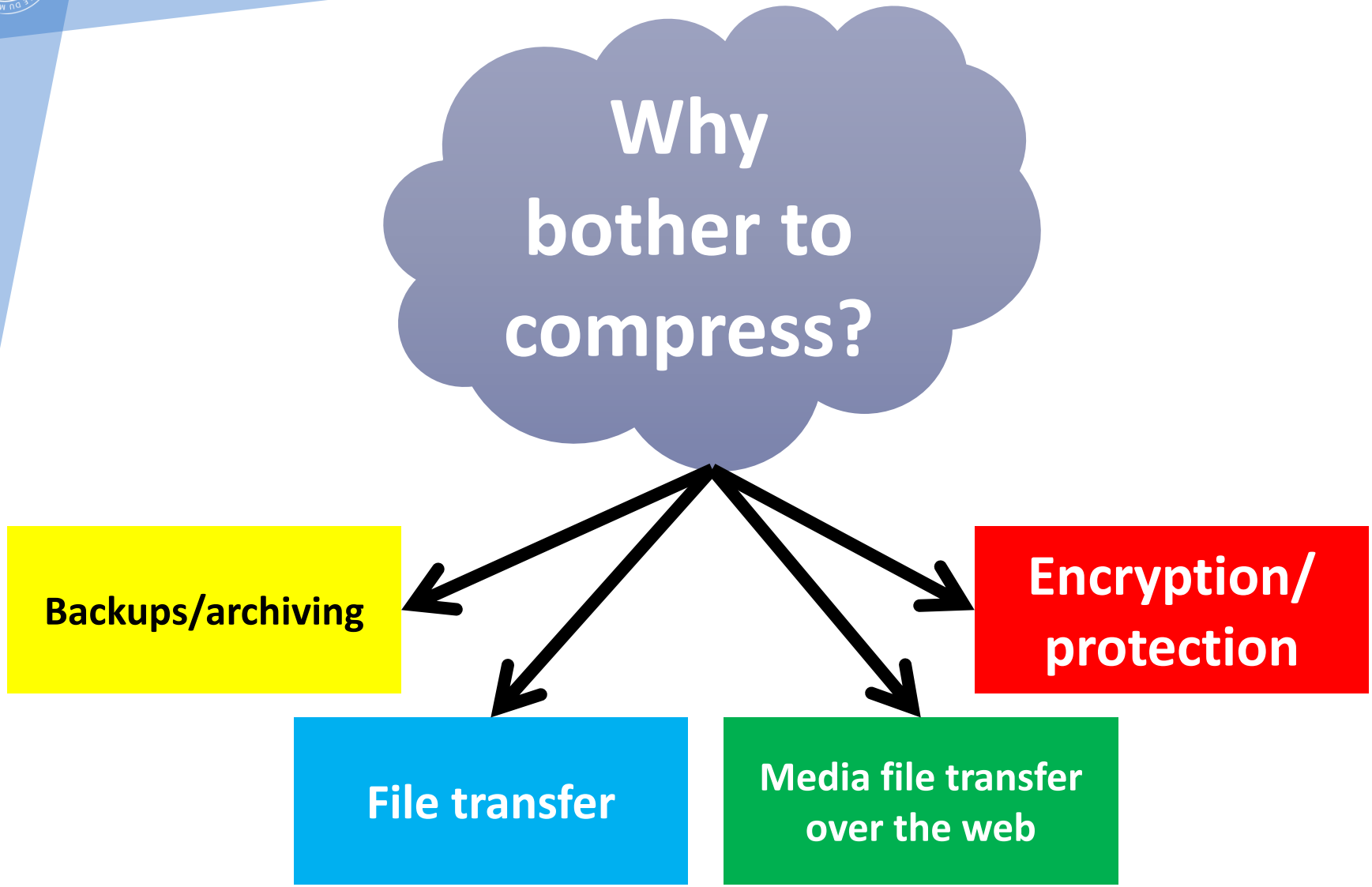
Definition: Compression

Data compression involves encoding information to use fewer bits than the original data entity.



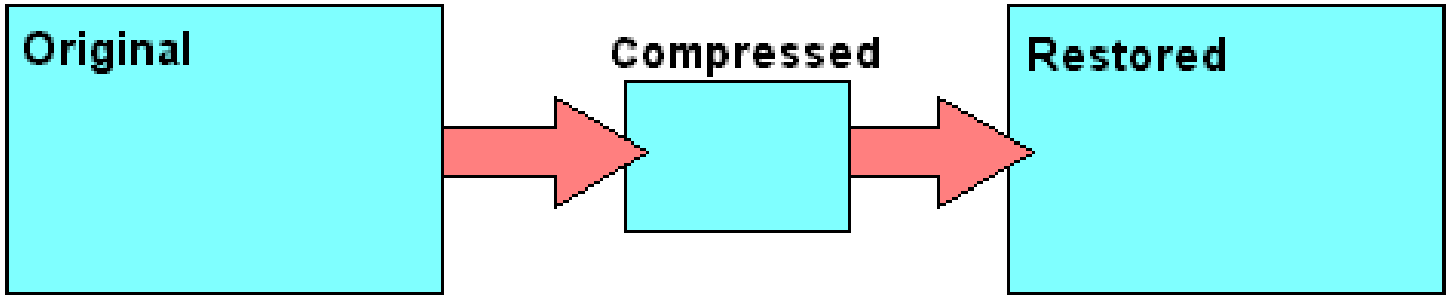
Key concept: Time!

- The **smaller** we can compress data, the **more** data we can send in the same amount of time.
- The consequence of this is that data can be **disseminated more rapidly**.

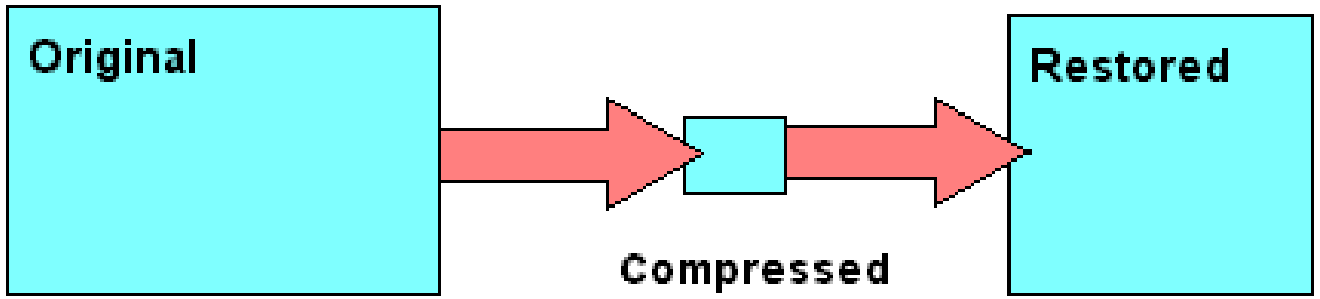

Why bother to compress?
Backups/archiving
Encryption/ protection
File transfer
Media file transfer over the web

Lossless vs Lossy Compression

LOSSLESS

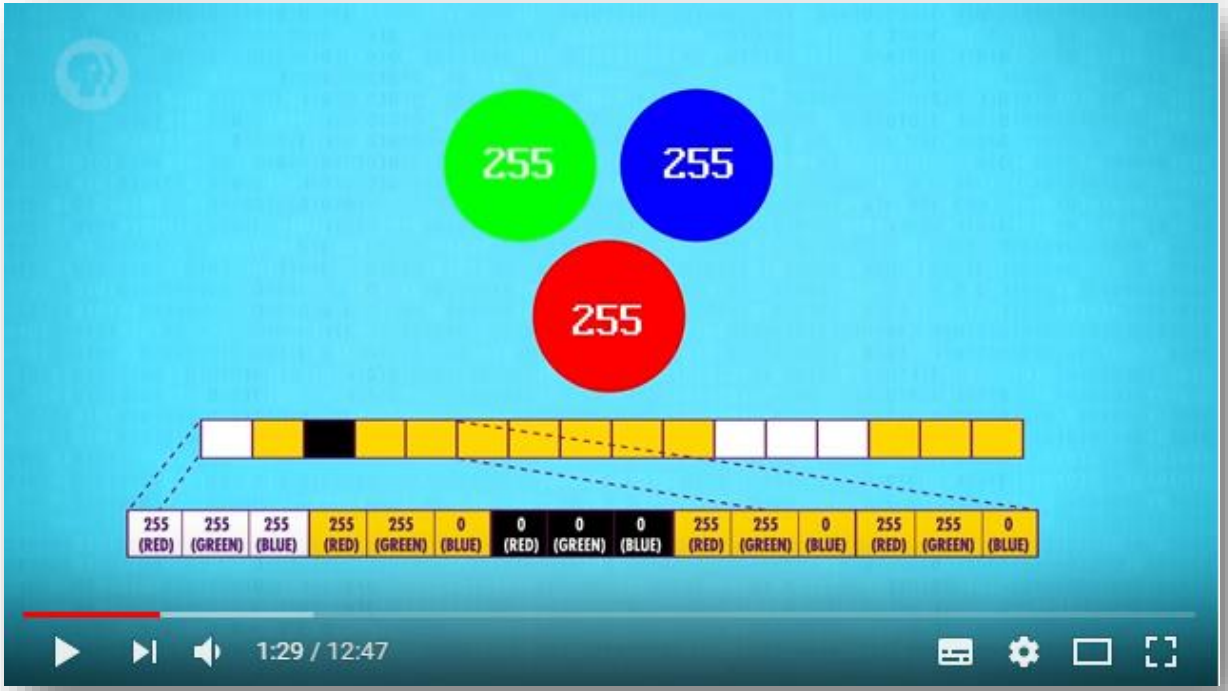


LOSSY



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

Video: Compression



Link (YouTube): https://youtu.be/OtDxDvCpPL4