

# OCR GCSE Computer Science Revision Checklist

## OCR Component 01

### Computing Systems

80 marks – 1 hour and 30 minutes, Written paper  
(no calculators allowed)

1.1 – Systems Architecture

1.2 – Memory

1.3 – Storage

1.4 – Wired & Wireless Networks

1.5 – Network Topologies, Protocols & Layers

1.6 – Systems security

1.7 – Systems Software

1.8 – Ethical, Legal, Cultural & Environmental Concerns

## OCR Component 02

### Computational Thinking, Algorithms & Programming

80 marks – 1 hour and 30 minutes, Written paper  
(no calculators allowed)

2.1 – Algorithms

2.2 – Programming Techniques

2.3 – Producing Robust Programs

2.4 – Computational Logic

2.5 – Translators & Facilities of Languages

2.6 – Data Representation

#### Credits:

1. Check list ripped from [OCR GCSE Computer Science J276 specification](#)
2. Video tutorial links from [craigdave.org](#)

# 1.1 – Systems Architecture



Video tutorial links: [https://www.youtube.com/watch?list=PLCiOXwirraUCaPt5zN4xJTlgKvzVYWa\\_5&v=t8H6-anK0t4](https://www.youtube.com/watch?list=PLCiOXwirraUCaPt5zN4xJTlgKvzVYWa_5&v=t8H6-anK0t4)

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>The purpose of the CPU</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Von Neumann architecture:</b>			
MAR (Memory Address Register)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MDR (Memory Data Register)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Program Counter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accumulator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Common CPU components and their function:</b>			
ALU (Arithmetic Logic Unit)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CU (Control Unit)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The function of the CPU as fetch and execute instructions stored in memory</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How common characteristics of CPUs affect their performance:</b>			
clock speed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cache size	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
number of cores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Embedded systems:</b>			
purpose of embedded systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
examples of embedded systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





# 1.4 Wired and wireless networks



Video tutorial links: [https://www.youtube.com/watch?list=PLCiOXwirraUCTooN8MYg4RDWF3FUC7JBU&v=ZAMbMcYqK\\_0](https://www.youtube.com/watch?list=PLCiOXwirraUCTooN8MYg4RDWF3FUC7JBU&v=ZAMbMcYqK_0)

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>Types of networks:</b>			
LAN (Local Area Network)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WAN (Wide Area Network)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Factors that affect the performance of networks</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The different roles of computers in a client-server and a peer-to-peer network</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The hardware needed to connect stand-alone computers into a Local Area Network:</b>			
wireless access points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
routers/switches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NIC (Network Interface Controller/Card)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
transmission media	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The internet as a worldwide collection of computer networks:</b>			
DNS (Domain Name Server)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hosting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the cloud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The concept of virtual networks</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# 1.5 Network topologies, protocols and layers

Video tutorial links: <https://www.youtube.com/watch?list=PLCiOXwirraUCzDEOPQiBSLIPTkDfFBiOO&v=vW3PeQ0XYc>

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>Star and mesh network topologies</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Wifi:</b>			
frequency and channels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
encryption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Ethernet</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The uses of IP addressing, MAC addressing, and protocols including:</b>			
TCP/IP (Transmission Control Protocol/Internet Protocol)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HTTP (Hyper Text Transfer Protocol)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HTTPS (Hyper Text Transfer Protocol Secure)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FTP (File Transfer Protocol)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POP (Post Office Protocol)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IMAP (Internet Message Access Protocol)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SMTP (Simple Mail Transfer Protocol)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The concept of layers</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Packet switching.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# 1.6 System security



Video tutorial links: <https://www.youtube.com/watch?list=PLCiOXwirraUBmdNk9YTirPOmCc-J3KP4W&v=v6Qgr1wT4uE>

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>Forms of attack</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Threats posed to networks:</b>			
malware	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
phishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
people as the 'weak point' in secure systems (social engineering)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
brute force attacks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
denial of service attacks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
data interception and theft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the concept of SQL injection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
poor network policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Identifying and preventing vulnerabilities:</b>			
penetration testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
network forensics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
network policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
anti-malware software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
firewalls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
user access levels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
passwords	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
encryption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# 1.7 Systems software



Video tutorial links: [https://www.youtube.com/watch?list=PLCiOXwirraUCX30hYq0CvNt47\\_ZTPMqcj&v=dJH\\_ev7DR5I](https://www.youtube.com/watch?list=PLCiOXwirraUCX30hYq0CvNt47_ZTPMqcj&v=dJH_ev7DR5I)

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>The purpose and functionality of systems software</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Operating systems:</b>			
user interface	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
memory management/multitasking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
peripheral management and drivers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
user management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
file management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Utility system software:</b>			
encryption software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
defragmentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
data compression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the role and methods of backup:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
full	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
incremental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# 1.8 Ethical, legal, cultural and environmental concerns

Video tutorial links: [https://www.youtube.com/watch?list=PLCiOXwirraUCHoD2tVSJ6ZmnHUayVr3WT&v=A\\_6NfRS3nt0](https://www.youtube.com/watch?list=PLCiOXwirraUCHoD2tVSJ6ZmnHUayVr3WT&v=A_6NfRS3nt0)

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>How to investigate and discuss Computer Science technologies while considering:</b>			
ethical issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
legal issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cultural issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
environmental issues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
privacy issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How key stakeholders are affected by technologies</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Environmental impact of Computer Science</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Cultural implications of Computer Science</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Open source vs proprietary software</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Legislation relevant to Computer Science:</b>			
The Data Protection Act 1998	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer Misuse Act 1990	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Copyright Designs and Patents Act 1988	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creative Commons Licensing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Freedom of Information Act 2000.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# 2.1 Algorithms



Video tutorial links: <https://www.youtube.com/watch?list=PLCiOXwirraUAf7ueVPI99gktxzJNElyCC&v=TVUvDdpml70>

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>Computational thinking:</b>			
abstraction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
decomposition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
algorithmic thinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Standard searching algorithms:</b>			
binary search	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
linear search	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Standard sorting algorithms:</b>			
bubble sort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
merge sort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
insertion sort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How to produce algorithms using:</b>			
pseudocode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
using flow diagrams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Interpret, correct or complete algorithms</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# 2.2 Programming techniques



Video tutorial links: [https://www.youtube.com/watch?list=PLCiOXwirraUDRk5TIB2uIS3V2-0tB3vcS&v=AaLk\\_fEVCiY](https://www.youtube.com/watch?list=PLCiOXwirraUDRk5TIB2uIS3V2-0tB3vcS&v=AaLk_fEVCiY)

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
The use of variables, constants, operators, inputs, outputs and assignments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The use of the three basic programming constructs used to control the flow of a program:			
sequence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
selection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iteration (count and condition controlled loops)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The use of basic string manipulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The use of basic file handling operations:			
open	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
read	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
write	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
close	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the use of records to store data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the use of SQL to search for data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the use of arrays (or equivalent) when solving problems, including both one and two dimensional arrays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			Contd...



# 2.3 Producing robust programs



Video tutorial links: <https://www.youtube.com/watch?list=PLCiOXwirraUD62R4SNX3Uud5y4dIDh1P&v=Jylki33P9g0>

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>Defensive design considerations:</b>			
input sanitisation/validation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
planning for contingencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
anticipating misuse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
authentication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Maintainability:</b>			
comments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
indentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>The purpose of testing</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Types of testing:</b>			
iterative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
final/terminal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>How to identify syntax and logic errors</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Selecting and using suitable test data</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





# 2.6 Data representation



Video tutorial links: <https://www.youtube.com/watch?v=VqtNhHI8JwM&t=0s&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=72>

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>Units:</b>			
bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, petabyte	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
how data needs to be converted into a binary format to be processed by a computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Numbers:</b>			
how to convert positive denary whole numbers (0–255) into 8 bit binary numbers and vice versa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
how to add two 8 bit binary integers and explain overflow errors which may occur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
binary shifts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
how to convert positive denary whole numbers (0–255) into 2 digit hexadecimal numbers and vice versa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
how to convert from binary to hexadecimal equivalents and vice versa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
check digits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Characters:</b>			
the use of binary codes to represent characters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the term 'character-set'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the relationship between the number of bits per character in a character set and the number of characters which can be represented (for example ASCII, extended ASCII and Unicode).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# 2.6 Data representation



Video tutorial links: <https://www.youtube.com/watch?v=VqtNhHI8JwM&t=0s&list=PLCiOXwirraUAvkTPDWeeSqAKty3LAG37-&index=72>

Specific knowledge required for GCSE Computer Science j276	Need to Revise	Revised Once	Got it!
<b>Images:</b>			
how an image is represented as a series of pixels represented in binary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
metadata included in the file	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the effect of colour depth and resolution on the size of an image file.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Sound:</b>			
how sound can be sampled and stored in digital form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
how sampling intervals and other factors affect the size of a sound file and the quality of its playback:			
sample size	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bit rate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sampling frequency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Compression:</b>			
need for compression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
types of compression:			
lossy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lossless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>