



30 Things Students Do Wrong in IGCSE Computer Science Paper 1

This guide by **FutureLogic Education** identifies the 30 most common mistakes students make in IGCSE Computer Science Paper 1 — and shows exactly how to fix them.

■ Command Word Mistakes — 1 to 5

1 Writing too much for "Identify"

X Wrong

A laser printer because it uses toner and produces high quality output.

✓ Correct

Laser printer.

EXAM TIP: IDENTIFY = one word or short phrase only. Any explanation earns zero extra marks.

Teacher note: Use this as a class warm-up. Show both answers — students immediately see the difference.

2 Giving a definition when asked to "State"

X Wrong

RAM is memory that stores programs temporarily while the computer is running.

✓ Correct

RAM is volatile memory.

EXAM TIP: STATE = one direct technical fact. Maximum one sentence.

Teacher note: Pair State and Explain questions in practice so students feel the difference in depth required.





3 Describing instead of explaining

x Wrong

"Packets travel across the network." (no reason given)

✓ Correct

"Packets travel across the network because packet switching allows different routes, therefore reducing congestion."

EXAM TIP: EXPLAIN = what + why + effect. Missing "because" or "therefore" loses the mark.

Teacher note: Train students to underline their power word in every explain answer. No power word = incomplete answer.

4 Ignoring the number of marks

x Wrong

Writing one sentence for a 3-mark explain question.

✓ Correct

3-mark explain = Point + Development + Consequence. Cover all three elements.

EXAM TIP: Glance at the mark allocation before writing. It tells you exactly how much to write.

Teacher note: Display the marks guide in class. Students who check the marks before writing consistently score higher.





5 Not using technical keywords

x Wrong

"The CPU is faster because it has more memory nearby."

✓ Correct

"Cache improves CPU performance because frequently used data is accessed faster than RAM, therefore processing speed increases."

EXAM TIP: Cambridge rewards precise vocabulary: volatile, parity bit, fetch-decode-execute, metadata, packet switching.

Teacher note: Build a keyword wall. Students who use Cambridge terminology in every answer pick up marks others miss.





■ Theory Answer Mistakes — 6 to 10

6 Saying RAM stores data permanently

✗ Wrong

RAM stores data permanently.

✓ Correct

RAM is volatile — it loses all data when power is switched off.

EXAM TIP: RAM = volatile = temporary. ROM = non-volatile = permanent. Learn both precisely.

Teacher note: Memory hook: RAM = Rarely Alive after poweroff. Silly but it works.

7 Mixing up primary and secondary storage

Primary Storage

- RAM
- ROM
- Cache

Secondary Storage

- HDD
- SSD
- Optical (CD/DVD)

EXAM TIP: HDD and SSD are SECONDARY storage — they are NOT primary. RAM and ROM are primary.

Teacher note: Students frequently put HDD as primary. Drill the distinction — it appears in almost every paper.





8 Forgetting that cache stores FREQUENTLY USED data

x Wrong

Cache stores all data.

✓ Correct

Cache stores frequently used data and instructions so the CPU can access them faster than RAM.

EXAM TIP: Cache = frequently used data. Not all data — only the most commonly accessed.

Teacher note: The word "frequently" is the key examiner term. Missing it can cost a mark.

9 Confusing compiler and interpreter

Compiler

- Translates whole program at once
- Produces a standalone executable file
- Faster to run after compilation

Interpreter

- Translates line by line
- Stops at first error
- No executable file produced

EXAM TIP: Compiler = whole program, produces executable. Interpreter = line by line, stops at errors.

Teacher note: A side-by-side compare question on compiler vs interpreter appears very frequently. Drill both sides.

10 Saying an IDE is a programming language

x Wrong

Python is an IDE.

✓ Correct

An IDE is software that provides tools for writing programs: code editor, auto-completion, debugger, and error diagnostics.

EXAM TIP: IDE = Integrated Development Environment. It is a tool, not a language.

Teacher note: Ask students: "Is Python an IDE?" The answer is no — Python is a language, PyCharm is an IDE.





Binary & Hexadecimal Mistakes — 11 to 15

11 Forgetting nibble = 4 bits

X Wrong

A nibble is 8 bits.

✓ Correct

A nibble = 4 bits (half a byte). A byte = 8 bits.

EXAM TIP: Bit (1) → Nibble (4) → Byte (8). Learn this sequence.

12 Adding binary like denary — forgetting carries

X Wrong

Writing no carry digits and producing a wrong result.

✓ Correct

Write carry digits above the next column every time. $1 + 1 = 10$ (carry 1). Never track carries mentally.

EXAM TIP: Always write carry digits above the column. Method marks are awarded even if the final answer is wrong.

Teacher note: Insist students show every carry in practice. It is a free mark — they just need to write it.

13 Forgetting overflow rules

X Wrong

"The answer is just wrong."

✓ Correct

Overflow occurs when the result is too large for the available bits. A carry out of the most significant bit = overflow.

EXAM TIP: If there is a carry out of the leftmost bit, state clearly: "This is overflow — the result is incorrect."





14 Messing up Two's Complement

x Wrong

Add 1 first, then invert the bits.

✓ Correct

Step 1: Invert ALL bits (0→1, 1→0). Step 2: Add 1. Never reverse the order.

EXAM TIP: Invert first. Add 1 second. Always in this order — reversing loses all marks.

Teacher note: Drill this as a two-step mantra. Students who reverse the steps get zero.

15 Confusing hexadecimal and denary conversions

x Wrong

Attempting to convert the whole binary number at once.

✓ Correct

Split binary into nibbles of 4 from the right. Convert each nibble independently to one hex digit.

EXAM TIP: Hex conversion: split into groups of 4 → convert each group → combine. Never convert the whole number at once.





Image & Sound Mistakes — 16 to 20

16 Saying colour depth improves resolution

Colour Depth

- Number of bits per pixel
- Determines number of colours
- More bits = more possible colours

Resolution

- Number of pixels in the image
- Determines image sharpness/detail
- More pixels = more detail

EXAM TIP: Colour depth \neq resolution. They are completely different properties — tested separately every year.

Teacher note: Give students a single sentence to memorise: Resolution = pixels. Colour depth = bits per pixel.

17 Forgetting metadata

X Wrong

"The image file just contains pixels."

✓ Correct

Images also contain metadata: date taken, camera model, GPS location, file size, colour depth.

EXAM TIP: Metadata = data about data. Always give specific examples — date, location, camera settings.





18 Confusing sample rate and sample resolution

Sample Rate

- Number of samples per second
- Measured in Hz or kHz
- Higher = more accurate sound wave

Sample Resolution

- Number of bits per sample
- Also called bit depth
- Higher = more precise amplitude values

EXAM TIP: Sample rate = samples per second (Hz). Sample resolution = bits per sample. Mix these up and lose marks.

Teacher note: Both increase file size AND quality. Students must distinguish them precisely.

19 Saying lossless compression removes data

x Wrong

Lossless compression removes some data to reduce file size.

✓ Correct

Lossless compression reduces file size with NO permanent data loss — the original can be fully restored.

EXAM TIP: Lossy = permanent data loss. Lossless = no data loss, fully reversible. Learn both definitions exactly.

20 Forgetting how RLE works

x Wrong

"RLE compresses images by removing pixels."

✓ Correct

RLE (Run Length Encoding) stores sequences of repeating values as a single value plus a count, rather than repeating each value.

EXAM TIP: RLE stores value + count, not the repeated values. Cambridge asks this frequently.

Teacher note: A worked example on the board — e.g. AAABBBCC → 3A 3B 2C — makes this immediately clear.





■ Network & Security Mistakes — 21 to 25

21 Saying packets always arrive in order

x Wrong

Packets always travel the same route and arrive in order.

✓ Correct

Packets may take different routes across the network and can arrive out of order. They are reassembled at the destination.

EXAM TIP: Packet switching = different routes, out-of-order arrival, reassembled at destination.

22 Confusing SSL and encryption

SSL/TLS

- Establishes a secure connection
- Uses digital certificates
- Validates the server identity

Encryption

- Converts plaintext to ciphertext
- Protects data content
- Uses keys to encode/decode

EXAM TIP: SSL establishes the secure channel. Encryption protects the data within it. They work together.

23 Forgetting public/private key roles

Public Key

- Available to anyone
- Used to ENCRYPT data
- Sent openly

Private Key

- Kept secret by owner
- Used to DECRYPT data
- Never shared

EXAM TIP: Public key encrypts. Private key decrypts. Reverse this and lose all marks.

Teacher note: Memory hook: Public = padlock (anyone can lock). Private = key (only owner can unlock).





24 Saying DNS stores websites

x Wrong

DNS stores websites.

✓ Correct

DNS stores domain names (URLs) and their matching IP addresses. It translates human-readable addresses into IP addresses.

EXAM TIP: DNS = Domain Name System. It converts domain names to IP addresses — it does not store websites.

25 Confusing proxy server and firewall

Proxy Server

- Caches web content
- Hides client IP addresses
- Can filter URLs

Firewall

- Filters network traffic
- Blocks unauthorised access
- Uses rules/policies

EXAM TIP: Proxy = caching + IP hiding. Firewall = traffic filtering + blocking. Different tools, different roles.





■ Error Detection & CPU Mistakes — 26 to 30

26 Forgetting parity bit only DETECTS — not corrects — errors

x Wrong

A parity bit corrects errors in transmission.

✓ Correct

A parity bit detects errors only — it does NOT correct them. If an error is detected, the data must be re-sent.

EXAM TIP: Parity bit = error DETECTION only. It cannot identify which bit is wrong or fix it.

27 Mixing up ARQ and echo check

ARQ (Automatic Repeat reQuest)

- Receiver sends acknowledgement
- Timeout triggers re-transmission
- Used in network protocols

Echo Check

- Receiver sends data back to sender
- Sender compares sent vs returned data
- Used in serial communication

EXAM TIP: ARQ = acknowledgement + timeout. Echo check = send back + compare. Different error detection methods.

28 Mixing up MAR and MDR

MAR — Memory Address Register

- Stores the memory ADDRESS being accessed
- Used in Fetch stage
- Points to a location in RAM

MDR — Memory Data Register

- Stores the DATA fetched from memory
- Holds data before/after transfer
- Temporary data buffer

EXAM TIP: MAR = Address (both have A). MDR = Data (both have D). A simple memory hook that never fails.

Teacher note: This distinction appears almost every year. Drill the memory hook until it is automatic.





29 Forgetting the role of the clock

x Wrong

The clock stores instructions.

✓ Correct

The clock controls the speed of the CPU by determining how many Fetch-Decode-Execute cycles occur per second, measured in GHz.

EXAM TIP: Clock = controls FDE cycle speed (GHz). Higher clock speed = more instructions per second.

30 Confusing Control Unit and ALU

Control Unit (CU)

- Controls the FDE cycle
- Manages flow of data
- Directs all CPU operations

ALU (Arithmetic Logic Unit)

- Performs arithmetic calculations
- Performs logical operations
- Handles comparisons

EXAM TIP: CU = controller. ALU = calculator. Two completely different roles inside the CPU.

Teacher note: CU = controls (C for control). ALU = arithmetic (A for arithmetic). Simple labels that stick.

