

7. Algorithm design and problem-solving

Starter Quiz · 课前小测

IGCSE Computer Science

Name: _____ Score: _____

1. Abstraction means:

- ☐ keeping only the important details and ignoring the rest
- ☐ breaking a problem into smaller parts
- ☐ writing in binary
- ☐ testing with extreme data

2. Checking that an age is between 0 and 120 is a:

- ☐ range check
- ☐ presence check
- ☐ format check
- ☐ double entry

3. A linear search finds a value by:

- ☐ checking each item in turn from the start
- ☐ halving the list each time
- ☐ sorting the list first
- ☐ swapping pairs

4. Pseudocode is:

- ☐ steps written in simple, code-like English (not a real language)
- ☐ machine code
- ☐ a flowchart
- ☐ a programming language that runs directly

5. Validation checks that data is sensible (in range, right type, not blank), while verification checks it was copied or entered correctly (e.g. double entry).

- ☐ True ☐ False

6. A bubble sort puts a list in order by:

- ☐ comparing side-by-side pairs and swapping any that are out of order, repeatedly
- ☐ checking each item once
- ☐ dividing the list in two
- ☐ building a binary tree

7. Using totalling on the list [2, 4, 6, 8], what is the final total?

8. Trace 'total = 0; FOR i = 1 TO 5: total = total + i'. What is total at the end?

9. Every algorithm can be decomposed into:

- ☐ input, processing and output
- ☐ header, payload and trailer
- ☐ analysis, design and testing
- ☐ sensor, microprocessor and actuator

10. Entering data twice and comparing the two copies is:

- ☐ double entry (a verification method)
- ☐ a range check
- ☐ a check digit
- ☐ abstraction

1. **keeping only the important details and ignoring the rest**

Abstraction simplifies; decomposition breaks a problem into parts.

2. **range check**

A range check confirms a value lies within allowed limits.

3. **checking each item in turn from the start**

Linear search examines items one by one until it finds the value or reaches the end.

4. **steps written in simple, code-like English (not a real language)**

Pseudocode describes an algorithm in readable, code-like English without being a real language.

5. **True**

Validation = "is it sensible?"; verification = "was it entered/copied correctly?" — you usually want both.

6. **comparing side-by-side pairs and swapping any that are out of order, repeatedly**

It swaps out-of-order neighbours and repeats passes until no swaps are needed.

7. **20**

$2 + 4 + 6 + 8 = 20$.

8. **15**

$1+2+3+4+5 = 15$ — the value the trace table builds up row by row.

9. **input, processing and output**

Input (data in) → processing (the work) → output (the result).

10. **double entry (a verification method)**

Double entry is a verification method — the two copies must match.