

# Paper 2 | GCSE Computer Science | Programming | Required knowledge

Programming techniques
<ul style="list-style-type: none"> <li>- <b>Sequence</b></li> <li>- <b>Selection</b> <ul style="list-style-type: none"> <li>- IF... ELSE...</li> </ul> </li> <li>- <b>Iteration</b> <ul style="list-style-type: none"> <li>- For &amp; While</li> </ul> </li> <li>- <b>Basic string manipulation</b></li> </ul>

<ul style="list-style-type: none"> <li>- <b>file handling operations:</b> <ul style="list-style-type: none"> <li>- open</li> <li>- read</li> <li>- write</li> <li>- close</li> </ul> </li> <li>- <b>the use of records to store data</b></li> <li>- <b>the use of SQL to search for data</b></li> </ul>
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<ul style="list-style-type: none"> <li>- <b>Arrays</b> <ul style="list-style-type: none"> <li>- one dimensional arrays</li> <li>- two dimensional arrays</li> </ul> </li> </ul>
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<ul style="list-style-type: none"> <li>- <b>Sub programs</b> <ul style="list-style-type: none"> <li>- Functions</li> <li>- Procedures</li> </ul> </li> </ul>
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<p><b>Data types</b></p> <ul style="list-style-type: none"> <li>- <b>Integer</b> e.g. 23</li> <li>- <b>Real</b> e.g. 23.7</li> <li>- <b>Character</b> e.g. A or 5</li> <li>- <b>String</b> e.g. A546TH</li> <li>- <b>Boolean</b> e.g. TRUE or FALSE.</li> </ul>
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<p><b>Operations</b></p> <ul style="list-style-type: none"> <li>- ADD +</li> <li>- SUBTRACT -</li> <li>- DIVIDE /</li> <li>- MULTIPLY *</li> <li>- MOD</li> <li>- DIV</li> </ul>
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Comparison operators	
Comparison operator	Meaning
= or ==	Is equal to
>	Is greater than
<	Is less than
<> or !=	Is not equal to
>=	Greater than or equal to
<=	Less than or equal to
- Operator priority: <b>BIDMAS</b>	

Robust programs
<ul style="list-style-type: none"> <li>- defensive design considerations:           <ul style="list-style-type: none"> <li>- input sanitisation/validation</li> <li>- planning for contingencies</li> <li>- anticipating misuse</li> <li>- authentication</li> </ul> </li> <li>- maintainability:           <ul style="list-style-type: none"> <li>- Comments &amp; Indentation</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>- Purpose of testing</li> <li>- Types of testing           <ul style="list-style-type: none"> <li>- Iterative</li> <li>- Final / terminal</li> </ul> </li> <li>- Selecting and using appropriate test data</li> <li>- Logic errors           <ul style="list-style-type: none"> <li>- Definition &amp; examples.</li> </ul> </li> <li>- Syntax errors           <ul style="list-style-type: none"> <li>- Definition &amp; examples.</li> </ul> </li> </ul>
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Translators & facilities of languages
<p><b>Low level languages:</b></p> <ul style="list-style-type: none"> <li>- Machine language           <ul style="list-style-type: none"> <li>- Op-code</li> <li>- Operand</li> </ul> </li> <li>- Assembly language           <ul style="list-style-type: none"> <li>- Mnemonics</li> </ul> </li> </ul> <p><b>High level languages:</b></p> <ul style="list-style-type: none"> <li>- Source code</li> <li>- Assembler</li> <li>- Compiler</li> <li>- Interpreter</li> </ul> <p><b>Integrated development environment (IDE).</b></p> <ul style="list-style-type: none"> <li>- Source code editor.</li> <li>- Error debugger.</li> <li>- Run time environment.</li> <li>- Translator (compiler or interpreter).</li> <li>- Automation tools</li> </ul>

It is your responsibility to make sure you regularly revisit this knowledge outside of class.