

## Topic 2.6 | GCSE Computer Science | Language's and IDE's

	Language	Syntax	Translation	Hardware dependent?	Example code
Low level	Machine Code	Data and instructions made up of 1's and 0's	Does need to be translated	YES (unique to each processor type)	11000101 11100101 11001101 11010101 01010111 11001000
	Assembly Language	Mnemonics/ Symbols	One statement translates to one machine code instruction	YES (unique to each processor type)	MDV1 #58 #6A LDA #6A
High Level	Python, JAVA, C++, Visual Basic	Resembles human language	One statement translates into many machine code language	NO - transferrable and usable on any computer	print ("Hello World")

**Python IDLE** contains a variety of features that support the development of code including

- **Syntax Highlighting** – coloured illustration of coded elements
- **Auto indentation** – keeping subroutines in proper locations
- **Bracket Matching** – Indicating matching sets of delimiters
- **Auto complete** – finding key words from dictionaries to aid with code entry
- **Syntax error checking** – illustrating the lines within the code that contain errors

### Common IDE Tools

**Editor** to enable program code to be entered/edited

**Error diagnostics / debugging** to display information about errors (syntax / run time) / location of errors and suggest solutions

**Run-time environment** to enable to the program to be run and check for run time errors / test the program

**Translator / compiler / interpreter** to convert the high level code into machine code / low level code / binary AND to enable to code to be executed / run

**Breakpoint** to stop/pause program execution at a specific point

**Watch window** to check contents of variables

**Syntax completion** suggests/corrects code

**Keyword highlighting / colour coding keywords / pretty printing colours**  
command words / variables

<b>High Level programming</b>	Also known as high level language. This is a computer programming language used to write programs. High-level languages need to be translated into machine code (binary) through a compiler, interpreter or assembler
<b>Low Level programming</b>	Also known as low level language. This is a computer programming language which closely represents machine language (binary). Low level languages are more difficult to understand than high-level languages, but they execute quicker.
<b>Translator</b>	Translators are needed to translate programs written in high level languages into machine code that a computer understands. Tools exist to help programmers develop error-free code.
<b>Assembler</b>	A program that translates assembly languages into machine code.
<b>Compiler</b>	A program that translates high-level programming language into machine code. It does the whole code in one go before running it.
<b>Interpreter</b>	A program that translates high-level programming languages into machine code. It does this one line at a time.
<b>IDE - Integrated Development Environment</b>	A piece of software with tools that helps a programmer to write error-free, maintainable code.
<b>Editor</b>	The part of an IDE that allows the user to write and amend code.
<b>Error Diagnostics/ Debug</b>	The process of finding and correcting programming errors
<b>Run Time Environment</b>	The part of an IDE where a program runs.

Programming