GCSE Computer Science
Topic 2.2 Programming (1)

Variables and constants are used to store values in algorithms and programs.

Variables' values can change while a program is running.

Constants' values must not change while a program is running.

Rules for naming variables/constants:
- Identifiers are the name of the variable or constant.
- They should 'describe' the data being stored.
- Short identifiers are quick/easy to write.
- Long identifiers are more descriptive.
- Identifiers cannot contain spaces must be consistent throughout the program.

CamelCaseUsesUpperAndLowerCaseLetters
Snake_case_links_all_the_words_with_an_underscore.

Operators are special characters that perform certain functions.

The **assignment operator is =**
It is used to assign values to constants or variables.

Comparison operators compare the value or expression on their left hand side to the value or expression on the right hand side and produce a Boolean value (True or False)

INPUT: Data that is put into the algorithm or program by the user.

OUTPUT:
- Data that is taken out of the program or algorithm and displayed to the user.
- This is usually done using a print statement.

SEQUENCE: Instructions are followed, one after the other in the order they are written.

SELECTION: Used in algorithms or programs to choose between two or more options.
Selection usually uses a combination of IF, ELSE and ELSE-IF statements.

IF/ ELSE statements are used when there are only 2 options.
- IF = QUESTION, followed by what to do if the answer is true.
- ELSE, what to do if the answer is False
- If there are more than 2 options, ELSE-IF is used.

Switch-case statements can also be used in selection;
- They are used when you want to perform different actions based on the value of a variable.

ITERATION: The process of repeating a set of instructions for a fixed number of times OR until there is a desired outcome.
Iteration is carried out using a programming construct called 'loops'.

COUNT CONTROLLED loops repeat code a fixed number of times.
The number of iterations is known before the loop is started.

CONDITION CONTROLLED: loops are used when the number of iterations needed is not known.
The code is iterated while or until a condition is met.

DATA TYPE: A category or classification of data.
Used to make programs more robust and memory efficient.

- INTEGER: A negative or positive WHOLE number.
- REAL: A negative or positive decimal number.
- CHARACTER: A SINGLE number, letter or symbol.
- STRING: A collection of characters enclosed in speech marks.
- BOOLEAN: True or False

CASTING: A function which converts an item of data into a different data type.

int()	Converts to an integer
float()	Converts into a real number
bool()	Converts into Boolean
str()	Converts to a string
ASC()	Converts into ASCII code
CHR()	Converts into ASCII character

Arithmetic operators: Characters that perform arithmetic functions.

+	Addition
-	Subtraction
*****	Multiplication
/	Division (decimal answer)
**	To the power of…
// DIV	Division (integer answer)
% MOD	Divides and returns the remainder.

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What I need to know:

What are variables / constants used for in programming?			
Define variable.			
Define constant.			
Outline the rules for naming constants/variables.			
What is an operator?			
What is the = operator used for?			
What is the function of comparison operators?			
Define the terms input / output.			
Define the term sequence.			
Outline what selection is used for in programming.			
Define the term 'iteration'.			
What is the difference between count-controlled and condition controlled iteration?			
Define the term data type.			
Name and describe the 5 main data types.			
Define the term casting.			
Outline the function of the 6 main casting commands.			
Define the term arithmetic operator.			
List the 7 main arithmetic operators and their mathematic function.			