



Computer Science
Logic Gates
Applicant Study Pack

Introduction	<p>Over the full two years, you will continually develop your programming ability in multiple languages, and as a result be a highly desirable candidate to potential universities and employers.</p> <p>You will begin with programming from the very first day and apply what you learn to more advanced programming concepts such as data structures and algorithms. This will be predominantly done within the first term, alongside learning about the fundamentals of computation.</p> <p>When you return after the first term, you will then be moving onto web development, databases and networks. What you learn here will also prepare you for your final year project during the second year of your course.</p> <p>The following term you will then learn about the fundamental low-level concepts of Computer Science, these include the system architecture such as processors and other hardware, and system software such as operating systems and memory management. After this point you will be able to explain exactly how a computer operates from the ground up.</p> <p>Recommended Skills and Interests</p> <ul style="list-style-type: none"> • Programming and solving problems • Always wanting to know “how things work” • Mathematics, in particular “Maths for Computing” • Looking for a career within Computing i.e. Cyber Security, Artificial Intelligence, Software Development etc. <p>You can be working on your programming ability right now in whatever language you choose! At Clarendon Sixth form you will use Python, Swift and JavaScript. If you have a strong ability in any of those languages coming into the course, you will hit the ground running.</p>								
Objectives	<p>Objectives:</p> <ul style="list-style-type: none"> - To identify how NOT, AND & OR gates process inputs. - To calculate the output of a logic circuit for a given set of inputs. <table border="1"> <thead> <tr> <th colspan="2">Literacy – Key Words</th> </tr> </thead> <tbody> <tr> <td>Binary Logic</td> <td>Also known as Boolean Logic, it is the process of reducing values to either True or False, in order to perform calculations.</td> </tr> <tr> <td>Logic Gate</td> <td>A logic gate is a building block of the digital circuitry found in a CPU. It performs a logical operation on the inputs it receives.</td> </tr> <tr> <td>Truth Table</td> <td>A table showing all possible outputs from the various combinations of inputs that a gate can be supplied with.</td> </tr> </tbody> </table>	Literacy – Key Words		Binary Logic	Also known as Boolean Logic, it is the process of reducing values to either True or False, in order to perform calculations.	Logic Gate	A logic gate is a building block of the digital circuitry found in a CPU. It performs a logical operation on the inputs it receives.	Truth Table	A table showing all possible outputs from the various combinations of inputs that a gate can be supplied with.
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Task 1	<p>What is logic?</p> <p>Logic is used to make decisions. Generally speaking, the decisions we make are determined by rules that we know about the world. The decisions we make are based on whether or not these rules are true or false in a given situation.</p> <p>There are very few logic operations that a CPU will perform on its inputs. However, combinations of these lead to incredibly complex calculations. The logic operations that a CPU will perform are:</p> <ul style="list-style-type: none"> - The NOT operation - The AND operation - The OR operation <p>Use the following resource to:</p> <ol style="list-style-type: none"> 1) Draw the logic gate symbol for each logical operation 2) Create the truth table for each logical operation <p>BBC Bitesize – Boolean Logic https://www.bbc.co.uk/bitesize/guides/zc4bb9q/revision/2</p>
Task 2	<p>Use the following logic gate simulator to create combinations of the above logic gates.</p> <p>Logic.ly Logic Gate Simulator https://logic.ly/demo</p> <p>Screenshot the logic circuits that you were able to create and make a note of how the output changes based upon what inputs you use.</p>
Further reading / links	<p>Craig N Dave – Logic Gates @ GCSE https://student.craigndave.org/videos/ocr-gcse-sl2-4-simple-logic-diagrams</p> <p>Craig N Dave – Logic Gates @ A level https://student.craigndave.org/videos/ocr-alevel-sl15-logic-gates-and-truth-tables</p>
Call to action	<p>Visit our website – www.clarendon.ac.uk for more information.</p> <p>Attend our New Student Day</p> <p>Join us for enrolment in August. Letters will be sent to all applicants at the end of July with more details.</p>