



LEARNING

KNOWLEDGE NUGGET: DAY 3 - LOGIC GATES									
Topic	Logic and Coding								
Learning objectives	Success criteria								
Students will... <ul style="list-style-type: none"> • be introduced to logic gates as the basic building blocks of any digital system and their effect on inputs and outputs. • be shown the 8 main types of logic gates, what they look like and how they work: <table style="margin-left: 20px; border: none;"> <tr> <td>○ BUFFER</td> <td>○ OR</td> </tr> <tr> <td>○ NOT</td> <td>○ NOR</td> </tr> <tr> <td>○ AND</td> <td>○ XOR</td> </tr> <tr> <td>○ NAND</td> <td>○ XNOR</td> </tr> </table> • take part in a logic gate challenge 	○ BUFFER	○ OR	○ NOT	○ NOR	○ AND	○ XOR	○ NAND	○ XNOR	<ul style="list-style-type: none"> - Watching and understanding the video in its entirety. - Participating in the logic gate challenge.
○ BUFFER	○ OR								
○ NOT	○ NOR								
○ AND	○ XOR								
○ NAND	○ XNOR								
Resources	Suggested use of teaching time								
<ul style="list-style-type: none"> - Knowledge Nugget Video - Logic Gate cheat sheet - Logic Gate challenge worksheet 	Video – 10 minutes Logic Gate Challenge – 5 Minutes (introduced as part of the video)								
Learning activity									
<p>The video will introduce the eight main types of logic gates, what they look like and how they work; walking through how different inputs are affected by the type of logic gate and how this impacts the output.</p> <p>This session will talk through a challenge containing multiple gates, the teacher may wish to pause the video during this phase to allow students to have a go themselves before the answer is revealed.</p> <p>Students will then be provided with a challenge (see worksheet) to complete themselves. Please note that the correct answers and walkthrough for this are provided as part of the Day 5 knowledge nugget video.</p>									
Evaluation and next steps									
<p>Websites:</p> <p>https://sciencedemos.org.uk/logic_gates.php Logic gate simulator - build your own and test them.</p> <p>Why not get the students to have a go at using the simulator website linked below to build this once they've settled on their answers, or just to create their own for their friends to try out.</p> <p style="color: red;">These links are being provided for informational purposes only; they do not constitute an endorsement or an approval by CyberFirst or the NCSC. The NCSC bears no responsibility for the accuracy, legality, or content of the external site or for that of subsequent links.</p> <p>https://www.ncsc.gov.uk/cyberfirst/girls-competition to register for the next CyberFirst Girls' Competition.</p>									