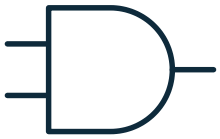
AND, OR and NOT gates

Core BUILD THE BASICS

C1 **State** what 1 means in a digital system. **[1]**

C2 **State** the name of this gate. **[1]**



C3 **Complete** the truth table for an OR gate. **[2]**

A	B	Z
0	0	
0	1	
1	0	
1	1	

C4 **State** another name for a NOT gate. **[1]**

C5 AND gate, A = 1, B = 1. **State** Z. **[1]**

C6 OR gate, A = 0, B = 0. **State** Z. **[1]**

C7 NOT gate, A = 1. **State** Z. **[1]**

C8 AND gate, A = 1, B = 0. **State** Z. **[1]**

Stretch GO FURTHER

S1 A heater should come on when it is NOT warm. **State** the gate needed after the temperature sensor. **[1]**

AND, OR and NOT gates

S2 A three-input AND gate has inputs 1, 1, 0. **State** the output. **[1]**

S3 A three-input OR gate has inputs 0, 0, 1. **State** the output. **[1]**

S4 **State** the gate needed for: 'the light comes on if the front door OR the back door opens'. **[1]**

S5 **State** the gates needed for a seatbelt alarm (engine on AND belt not fastened). **[2]**

S6 **Complete** the truth table for a NOT gate followed by an OR gate: Z = Ā + B. **[2]**

A	B	Z
0	0	
0	1	
1	0	
1	1	

Exam Ready QUALIFICATIONS SCOTLAND STYLE

E1 A ferry ramp may lower only when the ferry is docked AND the barrier is closed. **State** the gate and its Boolean expression (D = docked, B = barrier closed). **[2]**

E2 **Explain** why each input of a logic circuit needs a labelled input device in a simulation. **[2]**

E3 **Complete** the truth table for an AND gate. **[2]**

A	B	Z
0	0	
0	1	
1	0	
1	1	

AND, OR and NOT gates

E4 A dishwasher heater (Z) runs when the door is closed (D) AND the water level is OK (W). **[2]**

Complete the logic diagram with labelled inputs.

E5 **State** the output of an OR gate when both inputs are 1. **[1]**

Total: 26 marks. Use the Data Booklet. Show your working and give units.