Logic gate research

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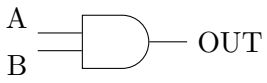
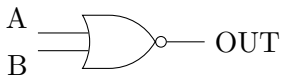
There are five main types of logic gate—NOT, AND, OR, NAND and NOR—which are the basis of digital electronics. Each one makes its decision in a different way.

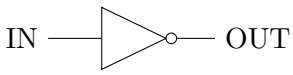
1. **Research Task** Using the your notes and the internet, match up the four of the five types of logic gate mentioned above to the correct symbols below, and fill in the truth tables.



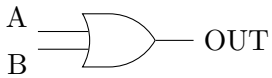
A	B	OUT
0	0	
0	1	
1	0	
1	1	



A	B	OUT
0	0	
0	1	
1	0	
1	1	



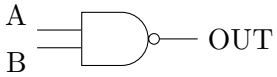
IN	OUT
0	
1	



A	B	OUT
0	0	
0	1	
1	0	
1	1	

2. What two symbols are used in digital electronics, to represent 'on' and 'off'? What is this system known as?

3. **If 101101 is the same as 45, what is the decimal equivalent of 10101? (*Hint: use the internet to help you with this...*)



A	B	OUT
0	0	1
0	1	1
1	0	1
1	1	0

4. *The NAND gate (shown above) is the cheapest type of logic gate to manufacture, and Charles Peirce showed that you can make all the other logic gates from different combinations of NAND gates. By working out the truth tables for the NAND combinations below (make additional columns—like the ones in class—as you need them to follow the 1s and 0s through the combination, taking care with labels), label them as NOR, AND, OR and NOT logic circuits as appropriate.