

10 Logic gates – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
Boolean logic	布尔逻辑	_____
Logic gates	逻辑门	_____
AND	与门	_____
OR	或门	_____
NOT	非门	_____
truth table	真值表	_____

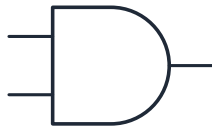
Recall

Boolean logic 布尔逻辑 uses just two values: TRUE (1) and FALSE (0). **Logic gates** 逻辑门 work on these.

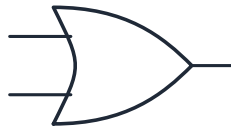
New ideas

Read these first, then do the Practice.

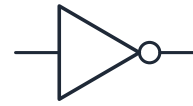
- 1 AND, OR, NOT



AND



OR



NOT

- **AND** 与门: output 1 only if **both** inputs are 1;
- **OR** 或门: output 1 if **either** input is 1;
- **NOT** 非门: flips the input ($0 \rightarrow 1$, $1 \rightarrow 0$).

■ 2 A truth table

A **truth table** 真值表 lists the output for every input:

A	B	$A \cdot B$
0	0	0
0	1	0
1	0	0
1	1	1

AND

Watch out: **AND** outputs 1 only when *both* inputs are 1; **OR** outputs 1 when *either* (or both) is 1; **NOT** *flips* the single input. Don't confuse AND with OR — AND is the stricter one.

Practice

Try these in order.

10.1 What two values does Boolean logic use? [1]

10.2 When does an AND gate output 1? [1]

10.3 When does an OR gate output 1? [1]

10.4 What does a NOT gate do? [1]

10.5 What is the output of 1 AND 0? [1]

10.6 Challenge. Give the output of (a) 1 AND 1, (b) 1 OR 0, (c) NOT 0. [3]