

# NAND Gate

## Data

IDs:

- 205 [block]
- 461 [item]

Name:

- NAND Gate [block]
- NAND Gate [item]

Texture:

- MoareAI/Blocks/LGNOROn.png [block, on] 
- MoareAI/Blocks/LGNOROff.png [block, off] 

Icon:

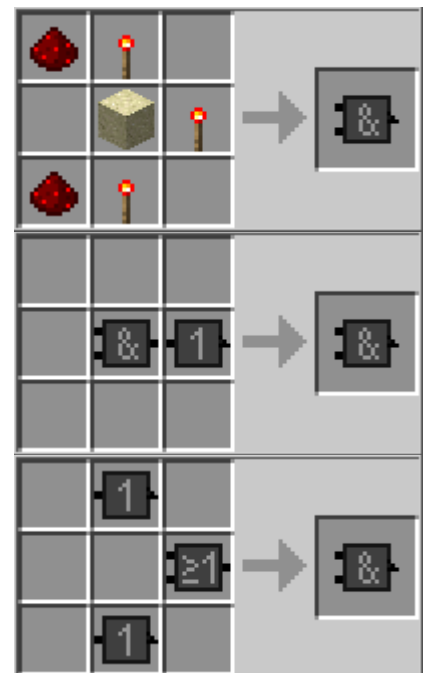
- MoareAI/Items/LGAND.png [item] 

## Recipes

<a href="#">Redstone (Dust)</a>	<a href="#">Redstone Torch</a>		=>	NAND Gate (Item)
	<a href="#">Sand</a>	<a href="#">Redstone Torch</a>		
<a href="#">Redstone (Dust)</a>	<a href="#">Redstone Torch</a>			

AND Gate (Item)	NOT Gate (Item)	=>	NAND Gate (Item)
-----------------	-----------------	----	------------------

NOT Gate (Item)		=>	NAND Gate (Item)
	OR Gate (Item)		
NOT Gate (Item)			



## Interacting

After crafting the item “NAND Gate” you can place it on the ground as the block “NAND Gate”, which will automatically power the output if the requirements are met (see function).

To pick it up again, destroy it by hitting it (one hit is enough) or by destroying the block underneath. This will yield the item “NAND Gate”. This will also happen if the gate comes in contact with water.

In contact with lava, both the item and the block is completely destroyed.

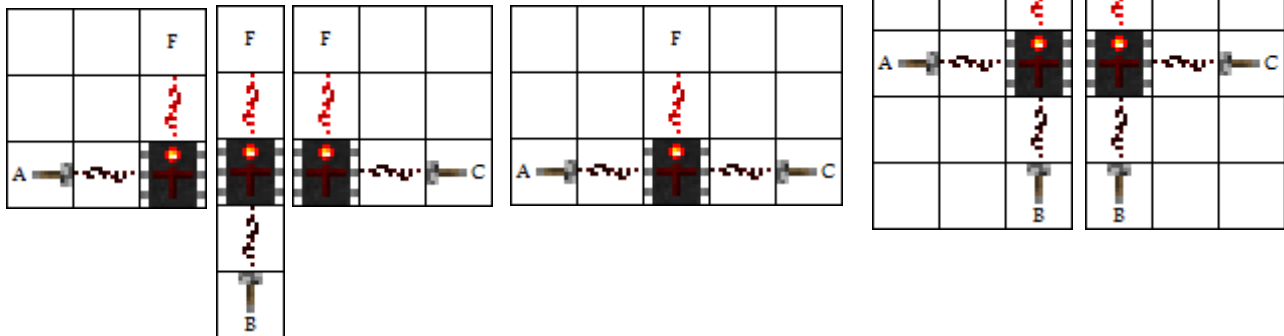


## How to wire the gate

The method of wiring, depends on the function (see function) where the number of wired inputs decides which function the gate have.

Wire as seen on the images, where “A”, “B” and “C” are the inputs and “F” is the output.

The input connections may be in form of an indirect signals, through [Redstone Wires](#), or a direct signal.



**WARNING:** Don't wire the output to one or more of the inputs, as this will cause Minecraft to crash

## The function of the gate

The gate's function is based on how many of the inputs is wired:

- 3 inputs: 3 input NAND gate
- 2 inputs: 2 input NAND gate
- 1 input: NOT gate

## 3 input NAND Gate

### As description

The output gives a signal when not all inputs (“A”, “B” and “C”) gets a signal.

- If there isn't signal on all of the inputs, there is a signal on the output
- If there is a signal on all of the inputs, there is no signal on the output.

### As Boolean algebra

$$F = \overline{A \cdot B \cdot C}$$

“Output F” equals NOT “input A” NAND “input B” NAND “input C”

### As truth table

C	B	A	F
0	0	0	<b>1</b>
0	0	1	<b>1</b>
0	1	0	<b>1</b>
0	1	1	<b>1</b>
1	0	0	<b>1</b>
1	0	1	<b>1</b>
1	1	0	<b>1</b>
1	1	1	0

## 2 input AND Gate

### As description

The output gives a signal when not all of the connected inputs (“A” and “B” or “A” and “C” or “B” and “C”) gets a signal.

- If there isn't signal on all of the connected inputs, there is a signal on the output
- If there is a signal on all of the connected inputs, there is no signal on the output.

### As Boolean algebra

$$F = \overline{A \cdot B}$$

“Output F” equals NOT “input A” NAND “input B”

*Or*

$$F = \overline{A \cdot C}$$

“Output F” equals NOT “input A” NAND “input C”

*Or*

$$F = \overline{B \cdot C}$$

“Output F” equals NOT “input B” NAND “input C”

### As truth table

B	A	F	C	A	F	C	B	F
0	0	1	0	0	1	0	0	1
0	1	1	0	1	1	0	1	1
1	0	1	1	0	1	1	0	1
1	1	0	1	1	0	1	1	0

# NOT Gate

## As description

The output is the inverse of the input.

- If there is a signal on the input, there is no signal on the output
- If there is no signal on the input, there is a signal on the output

## As Boolean algebra

$$F = \bar{A}$$

“Output F” equals NOT “input A”

*Or*

$$F = \bar{B}$$

“Output F” equals NOT “input B”

*Or*

$$F = \bar{C}$$

“Output F” equals NOT “input C”

## As truth table

<b>A</b>	<b>F</b>	<b>B</b>	<b>F</b>	<b>C</b>	<b>F</b>
0	1	0	1	0	1
1	0	1	0	1	0