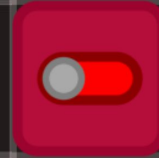# Digital Logic
Day 1

uarch.space

Wires

- Click and drag to move camera.
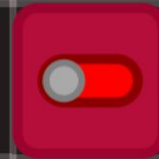- Scroll or press +/- to zoom in and out.

Sets the power connected wires

Reads the power of connected wires
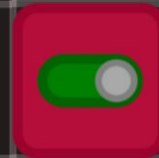
OUT 0

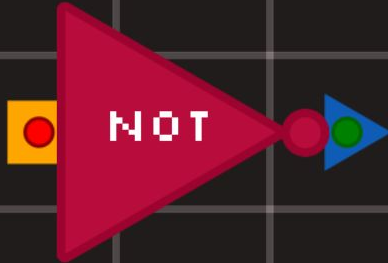click and drag to create wire

OUT 0

click to toggle switch on

OUT 0

NOT GATE

A NOT gate has one input 🔴 and one output ▶️. It inverts the signal that it gets.
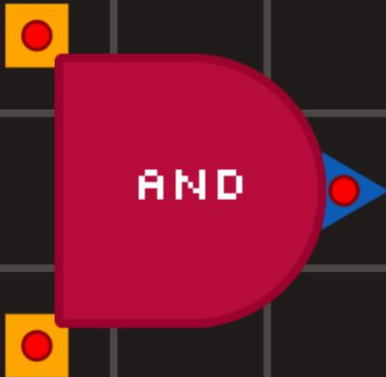
We can represent this with a truth table.

The A column represents the input; the Y column the corresponding output.

NOT ▶️

A	Y
🟢	🔴
🔴	🟢

AND GATE

A AND gate has two inputs 🔴 and one output ▶. It is on only when both inputs are on.

You can delete gates and wires by right clicking.

NAND GATE

A NAND gate has two inputs 🔴 and one output 🔵. It is same as AND, but the output is always inverted.

It's like an AND gate with a NOT gate on the end.

In this level you need to make your own gate. Your switch blocks have been replaced by INPUT blocks. Click the ➕ icon to place components down.

Click the play button to run the tests. If your circuit is correct, it should pass 4/4 tests.

A	B	Y
🟢	🟢	🔴
🟢	🔴	🟢
🔴	🟢	🟢
🔴	🔴	🟢

OR GATE

An OR gate has two inputs 🔴 and one output 🔵. It is on if at least one of the inputs is on.

You can move gates by clicking and dragging.

Hint:

What does the truth table look like if you invert every value?

NOR GATE

Just like NAND is AND but the output is inverted, NOR is OR, but the output is inverted.

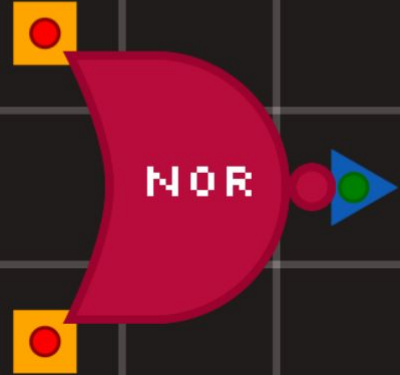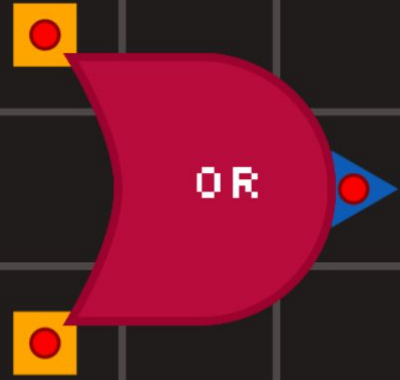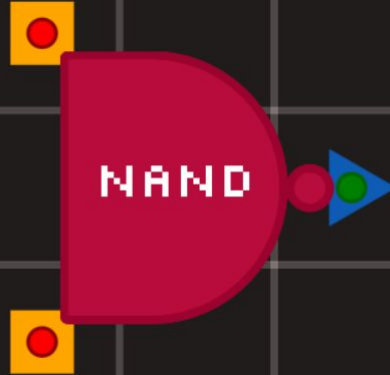Try to see how few gates you can use for this one!

A	B	Y
🟢	🟢	🔴
🟢	🔴	🔴
🔴	🟢	🔴
🔴	🔴	🟢

Challenges

- All of the gates you have made are unlocked now in the ➕ menu.
- Some of these gates are enough to make the rest of the gates. Which are they?
- What is De Morgan's laws and how do they apply here?

Solutions:

uarch.space/solutions/day1.pdf