The Human Logic Circuit

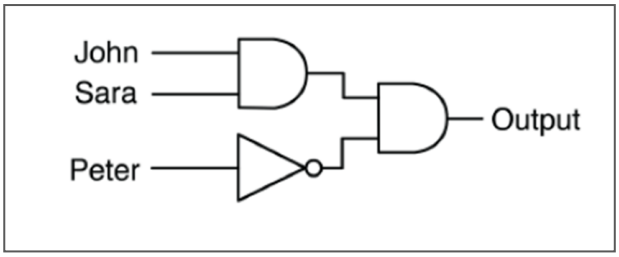
The following pages include all labels needed for a human logic circuit activity. Print them out, guillotine and provide each group with a set. Each group needs around 7 to 9 students. It often works well outdoors but an initial walkthrough indoors helps ensure understanding.

Before engaging in the activity challenge the students to draw the circuit represented by the statement.

"I will only go to the party if both John AND Sara are going, AND NOT Peter."

Once the circuit is agreed and understood (as shown), the groups need to assign roles.

Photocopy masters of names and logic gate labels are provided. There are more than required for the circuit so children need to decide which to use.



In the example the leader appoints 3 pupils as John, Sara and Peter. 3 more become logic gates and 1 acts as the output. One more records the results in a truth table (which could be the leader or output if numbers are short).

Children connect the circuit using hands on shoulders as shown. They transmit a Yes (1) by squeezing the shoulder. No squeeze, represents No (0). The challenge requires some co-ordination by the leader, so the inputs are sent at the same time, and the gate has time to calculate their response.

Each subsequent output must also be transmitted at the right time to allow the logic to ripple through the circuit. It is worth using this example as a walkthrough, before setting further challenges.

The completed truth table is displayed right.

A blank truth table to complete for the warm up exercise is provided along with the other photocopiable resources.

Inputs			Output
John going?	Sara going?	Peter going?	Go to the party?
NO	NO	NO	**0**
NO	NO	YES	**0**
NO	YES	YES	**0**
NO	YES	NO	**0**
YES	NO	NO	**0**
YES	YES	NO	**1**
YES	NO	YES	**0**
YES	YES	YES	**0**

Once the children get the hang of the activity challenge them to build human circuits, construct truth tables and derive the correct outputs for a variety of statements. Two are given below to get started, both require a little thought:

"I will NOT go to the party if either Sean OR Rob are going."

"I will NOT go to the party if either Sean OR Rob are going AND Melissa is NOT going"

Organise your circuit and record the results in the truth table after trying each combination of inputs given in the table below.

Inputs			Output
John going?	Sara going?	Peter going?	Go to the party?
NO	NO	NO	
NO	NO	YES	
NO	YES	YES	
NO	YES	NO	
YES	NO	NO	
YES	YES	NO	
YES	NO	YES	
YES	YES	YES	

Output

Sean

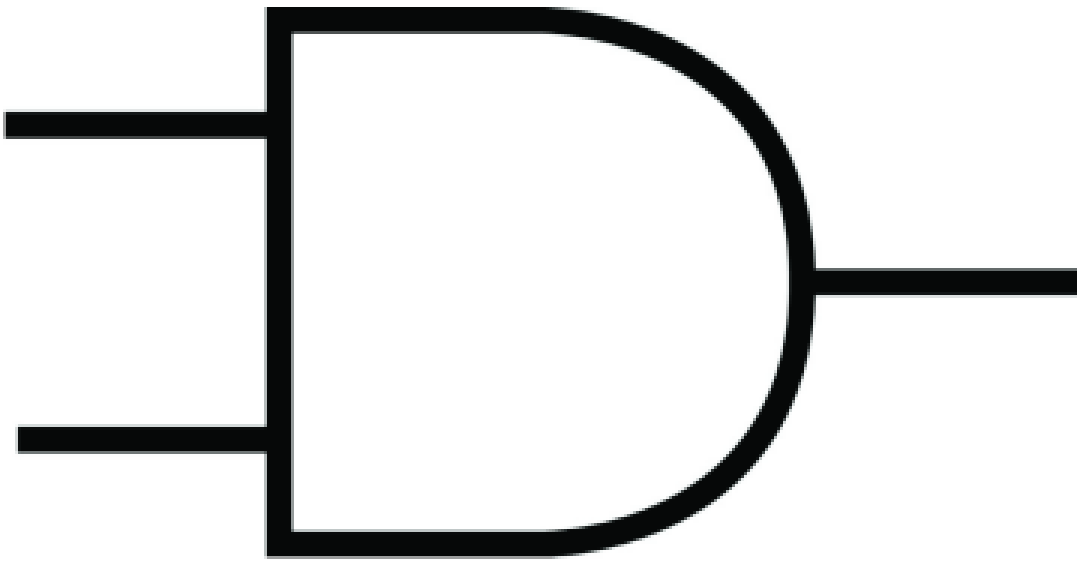
Rob

Peter

Melissa

Sara

John



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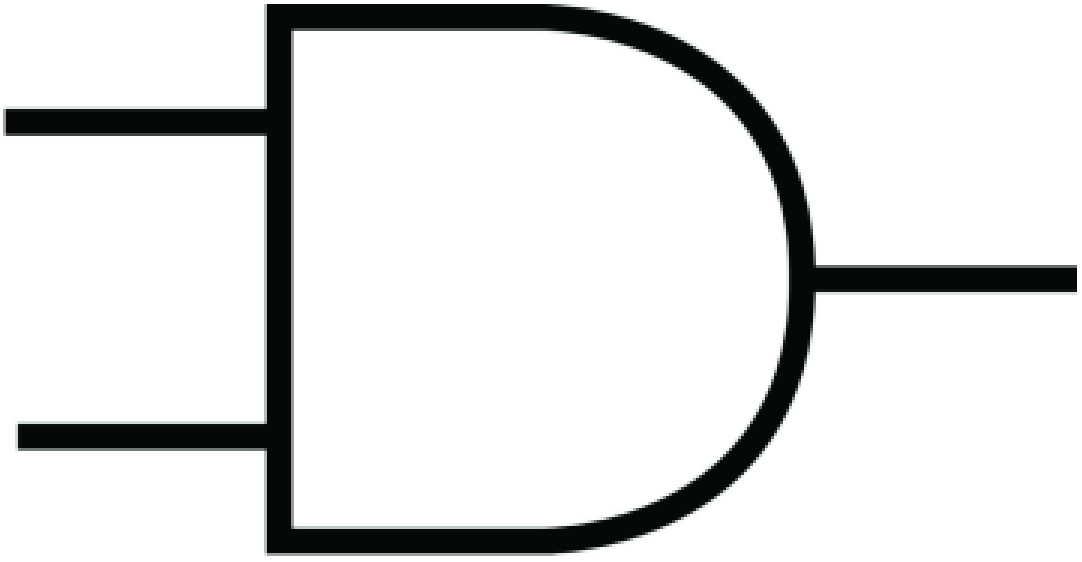

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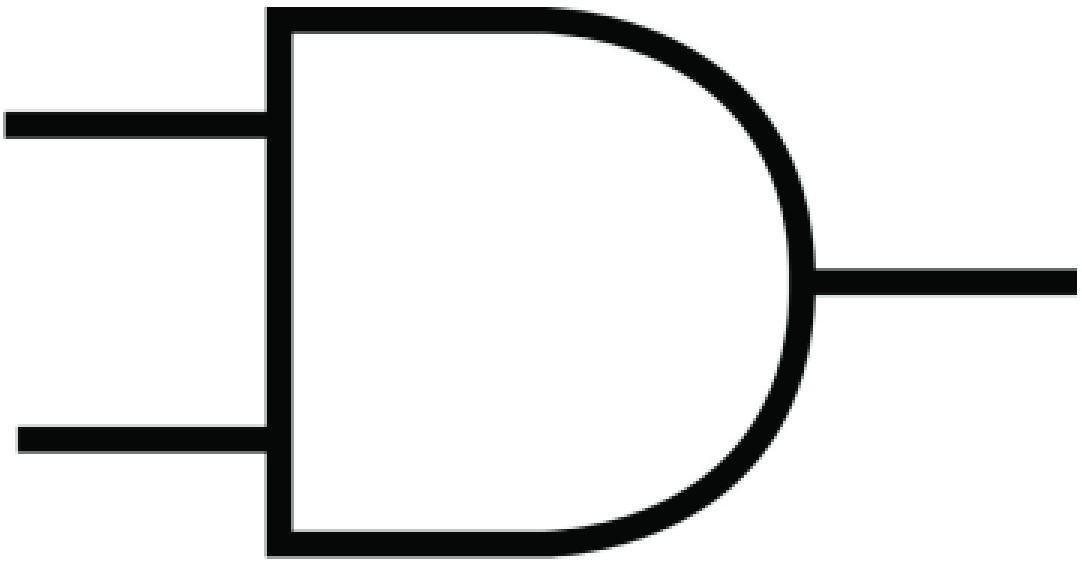

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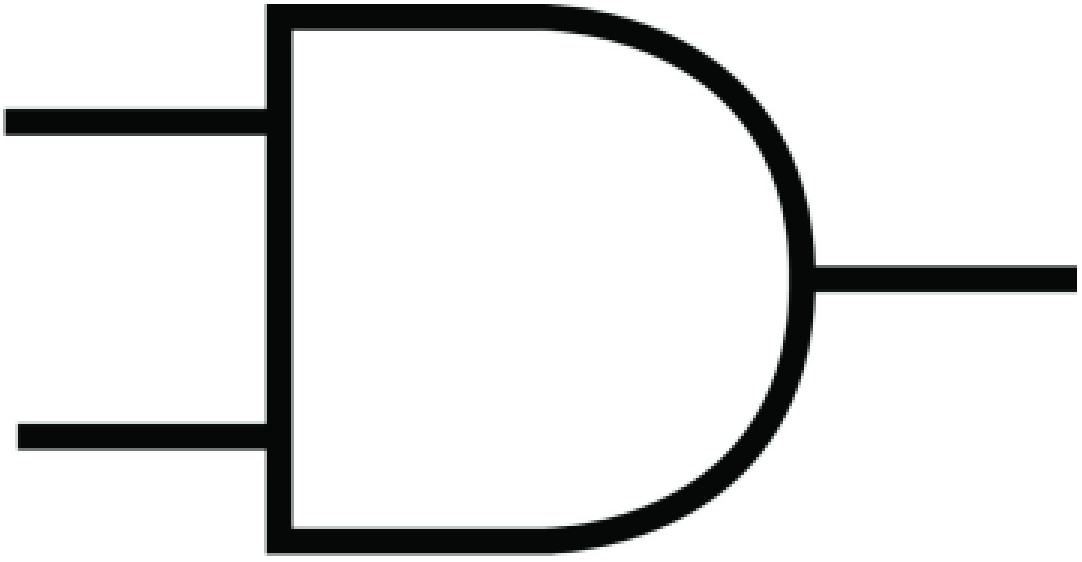

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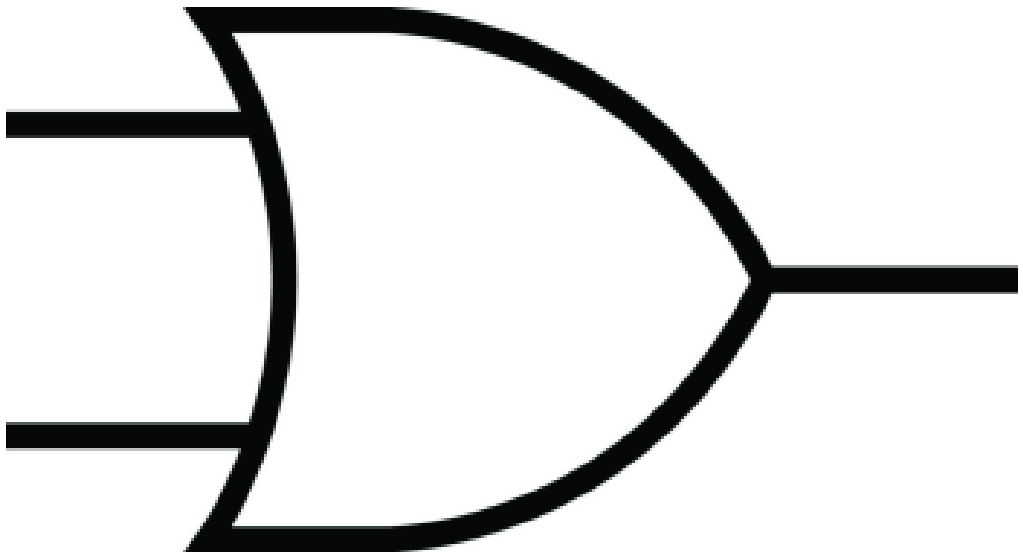

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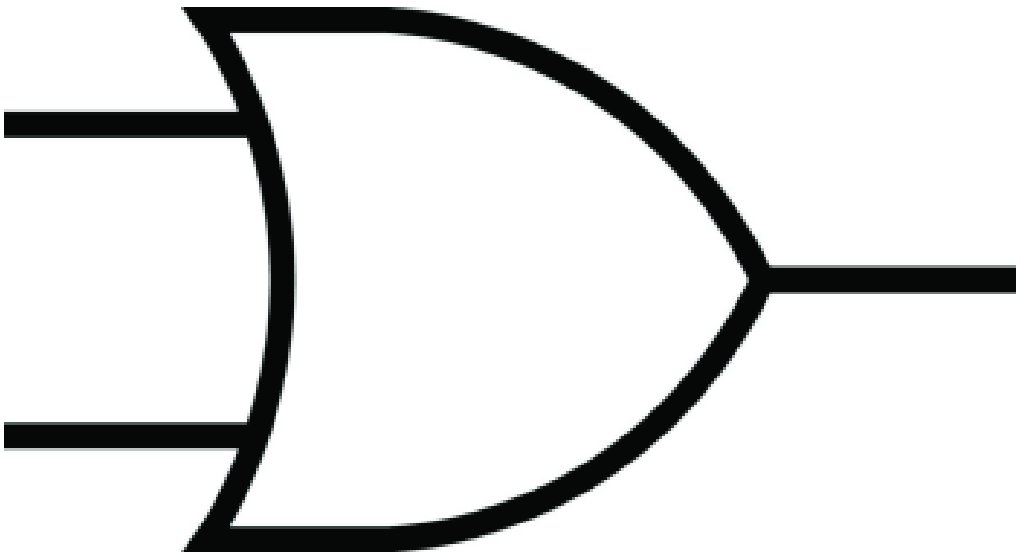

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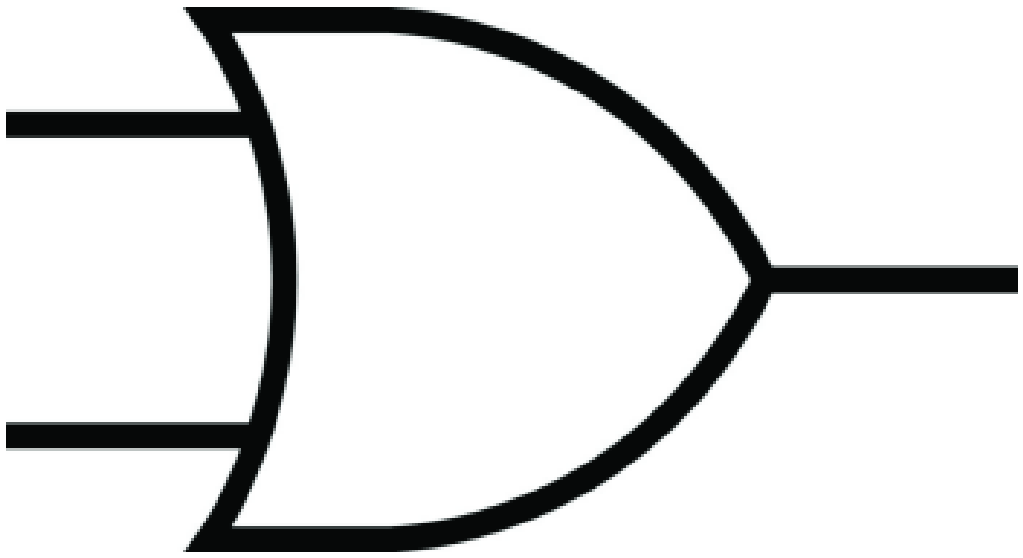

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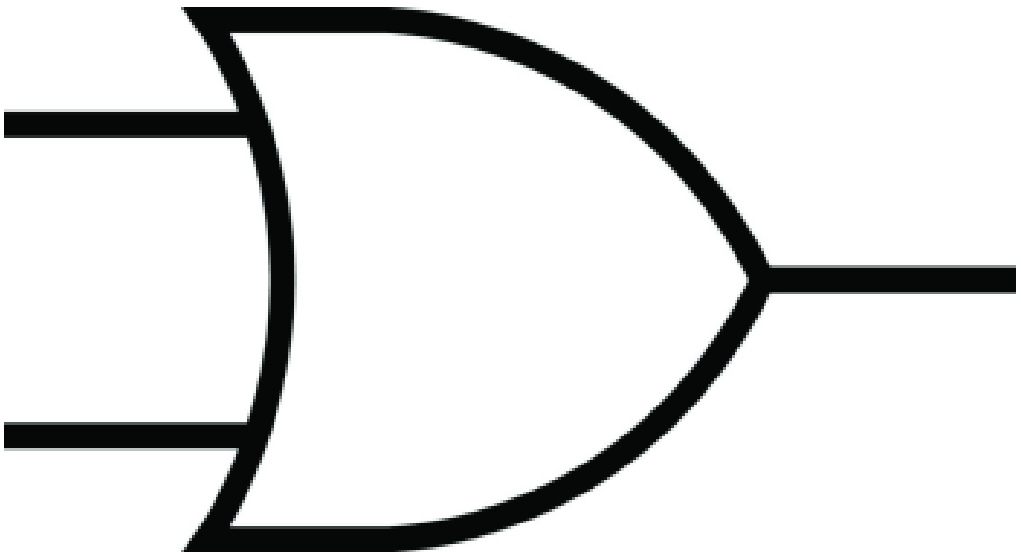

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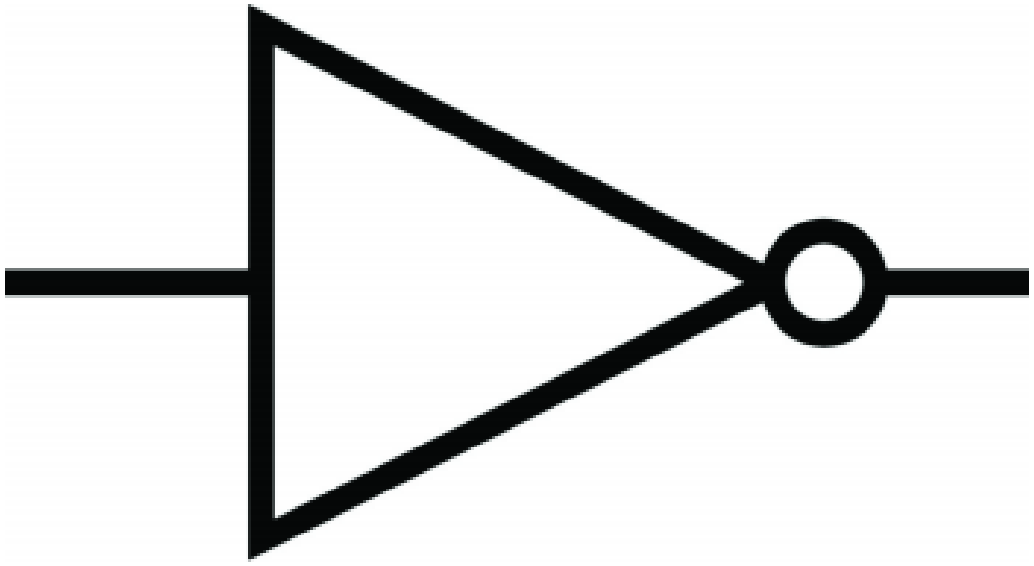
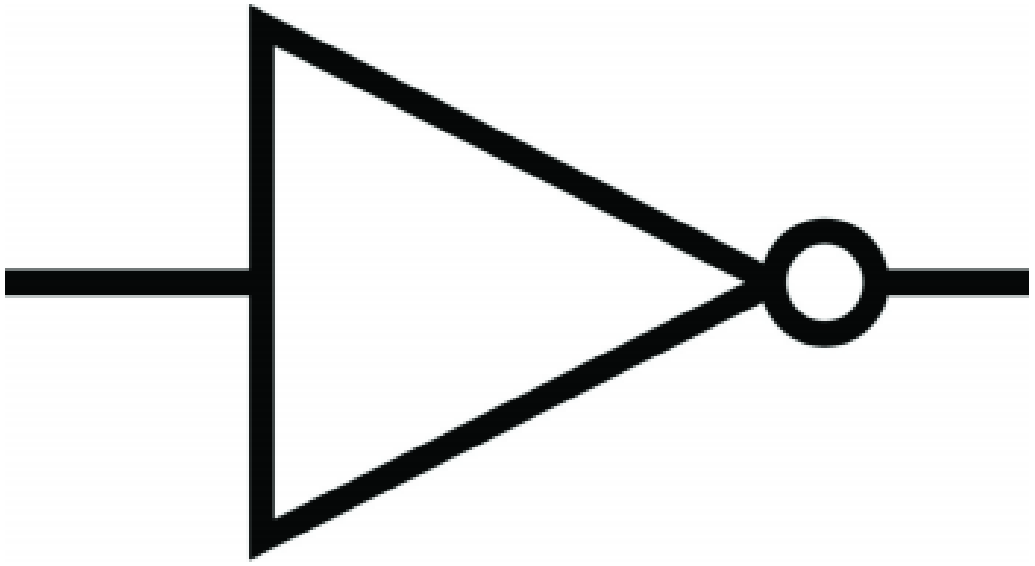


NOT



NOT