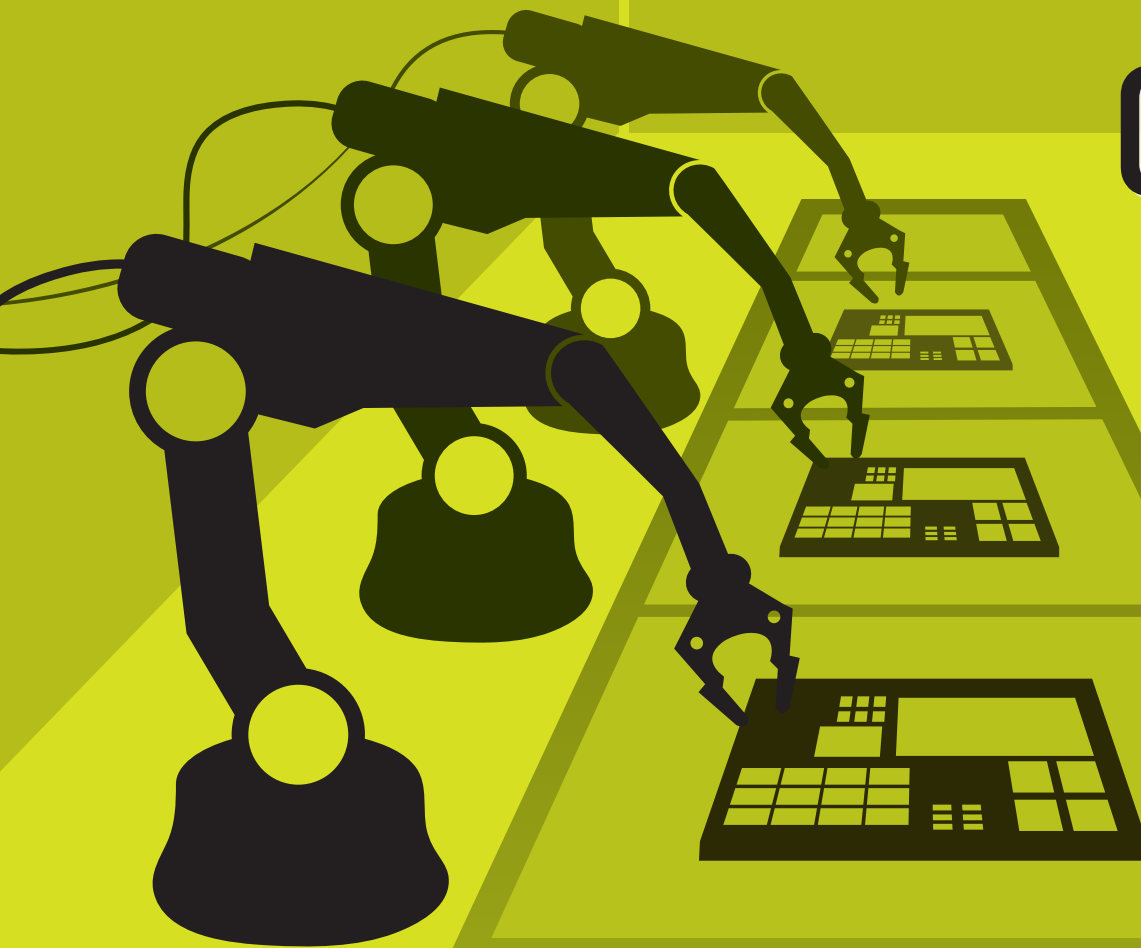




# // CODE ROBOT REPAIR

PROGRAMMING GAME SERIES //



## CAN YOU FIX THE ROBOT BRAIN?

[Click here for lesson plan](#)



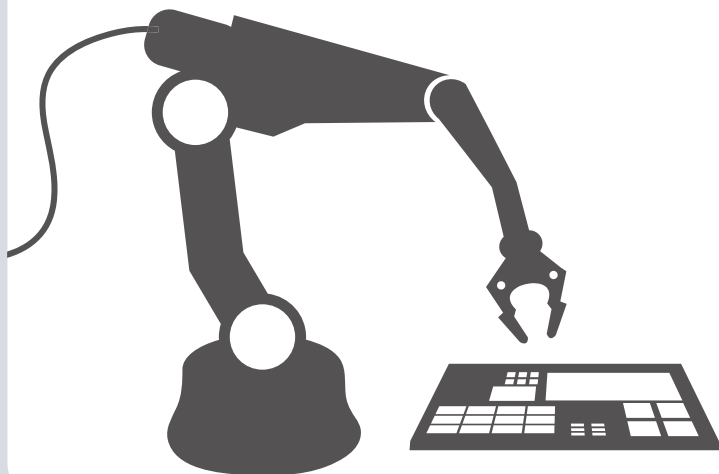
# //CODE ROBOT REPAIR

PROGRAMMING GAME SERIES //

In **ROBOT REPAIR**, you are a Cybernetics Specialist tasked with repairing a fleet of personal assistant robots. Each robot is reprogrammed by a different combination of wires and power cells. To repair each robot, you'll need to activate the colored wires by placing power cells on numbered nodes touching those wires.

Repair instructions are written in the form of clues, and your job is to interpret the clues and identify where to place power cells to activate the specified wires.

Now let's start repairing!

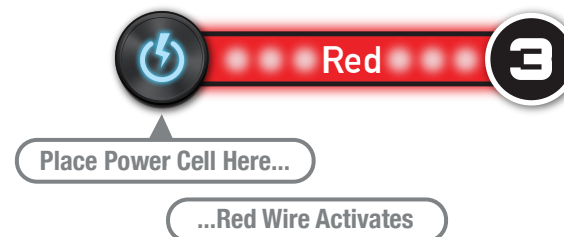


## Introduction & How to Play

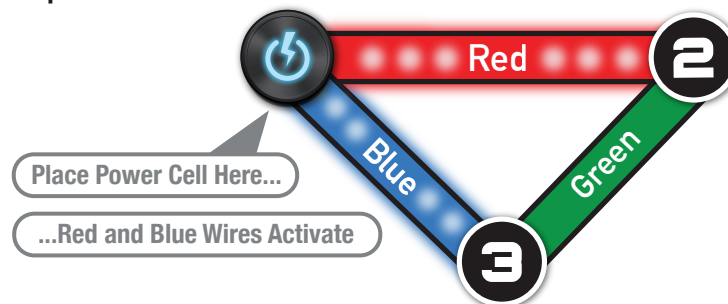
### Activating the Colored Wires

You activate one or more colored wires by placing a power cell onto the circuit board node that directly connects to the wire.

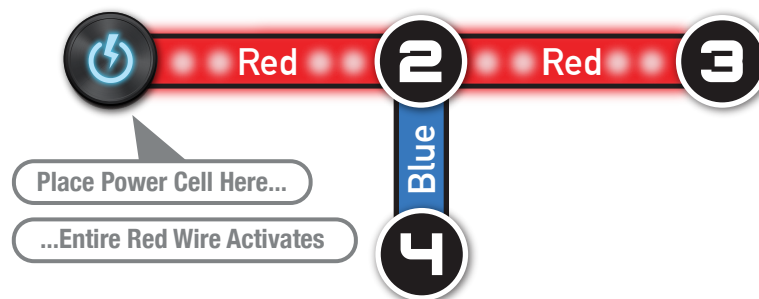
Example 1:



Example 2:



Example 3:





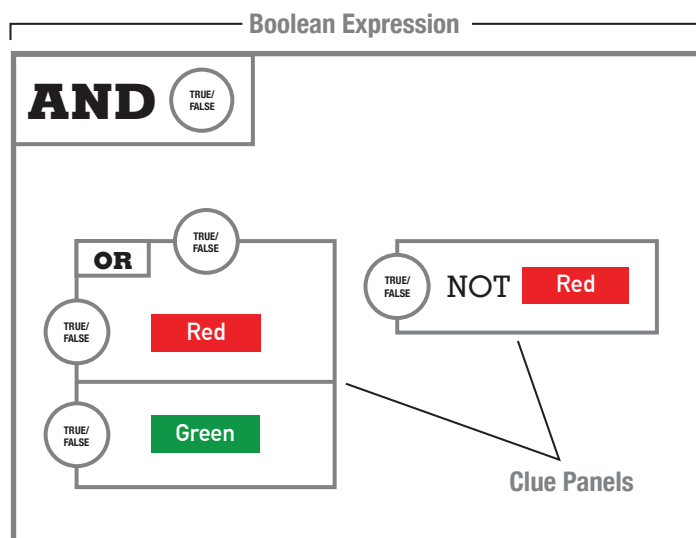
# //CODE ROBOT REPAIR

PROGRAMMING GAME SERIES //

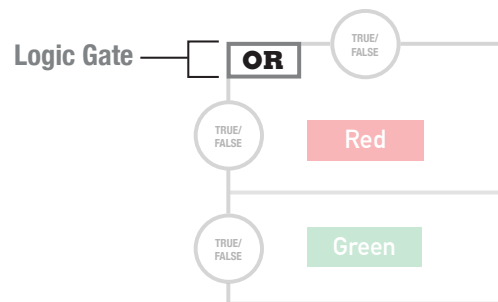
## How to Play (Cont'd)

### Boolean Expressions and Logic Gates

**BOOLEAN EXPRESSION:** Each challenge contains one Boolean expression made up of one or more clue panels. From this information, you will be able to determine on which node you must place a power cell.

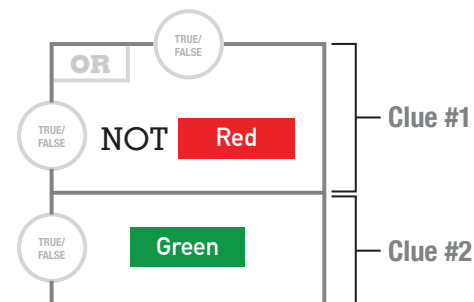


**LOGIC GATES:** Clue panels containing more than one clue also contain a logic gate. The meaning of each logic gate is found at the bottom of each challenge.



### Clues and Sensors

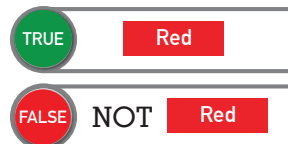
**CLUES:** Each of the clue panels contains at least one clue about a colored wire.



**SENSORS:** Each clue contains a sensor that connects back to the colored wires.



If the Red wire is powered ON, then Red is True and NOT Red is False.



If the Red wire is NOT powered on, then Red is False and Not Red is True.





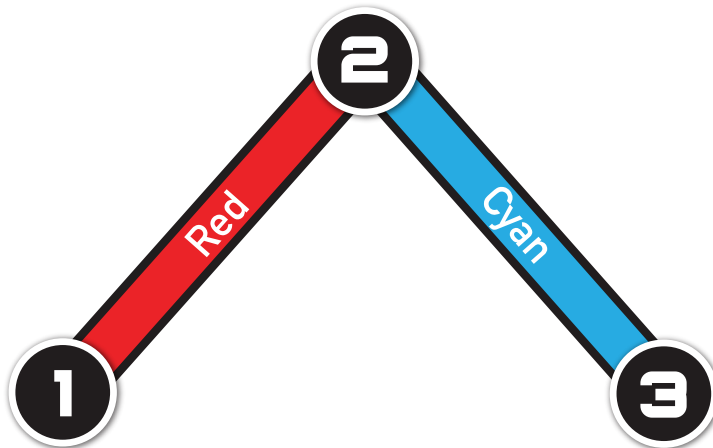
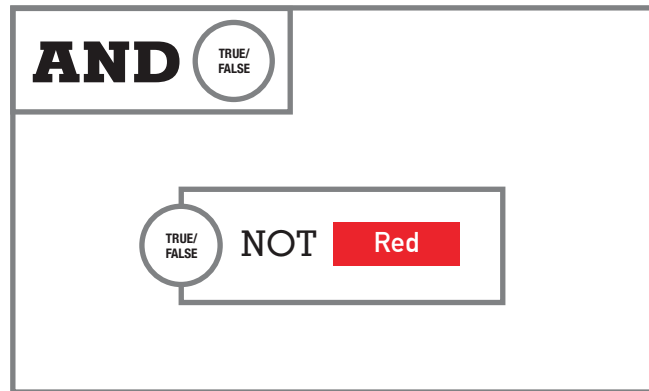
# //CODE ROBOT REPAIR

PROGRAMMING GAME SERIES //

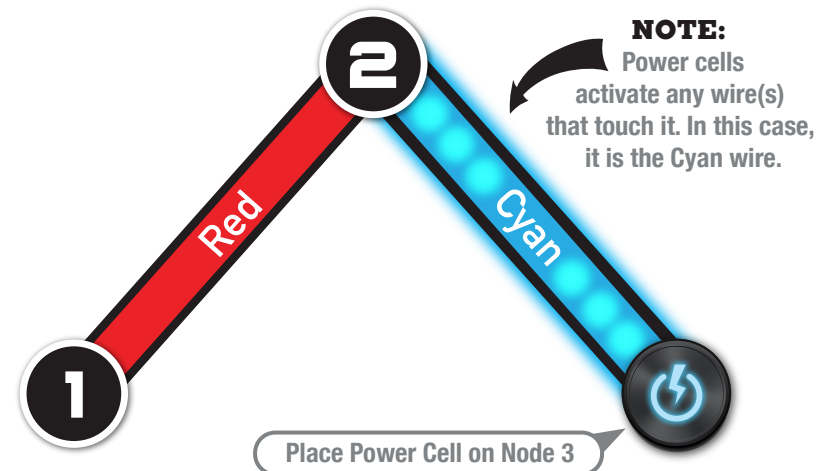
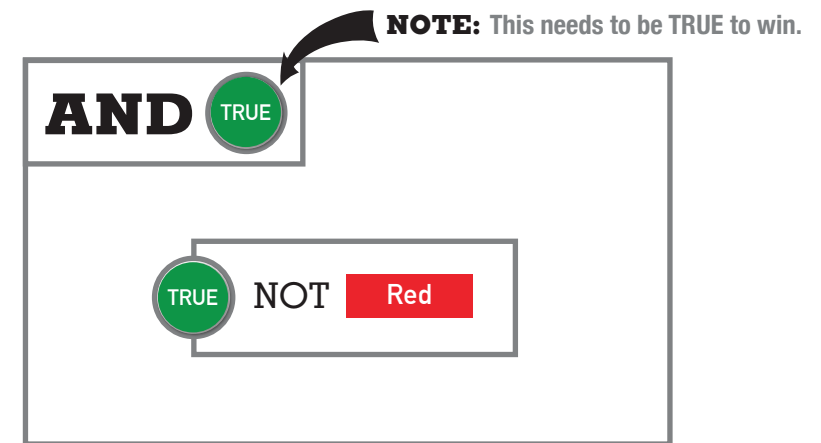
## Demo Challenge & Solution



What is the correct node on which to place the power cell so that the Red wire does *not* power on?



**SOLUTION:** Power cell goes on **E**. Placing it here will power the Cyan wire but *not* power the Red wire.

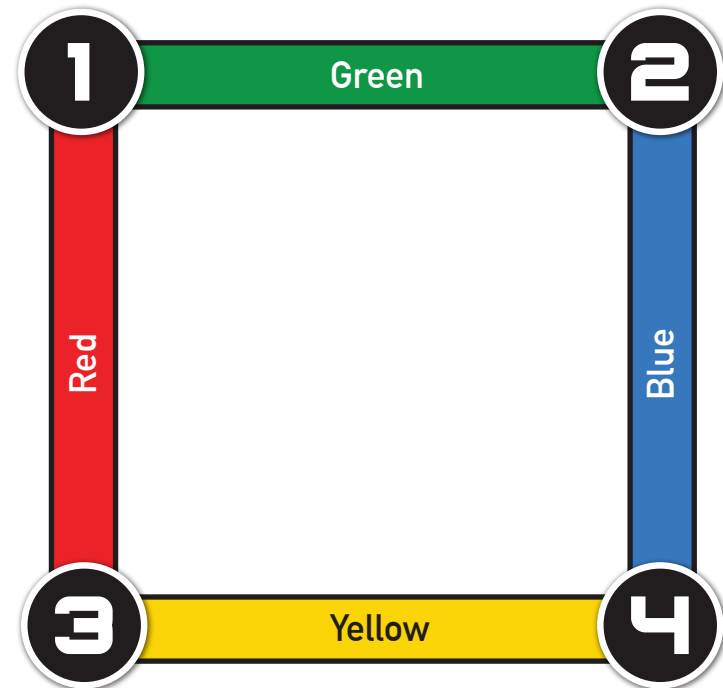
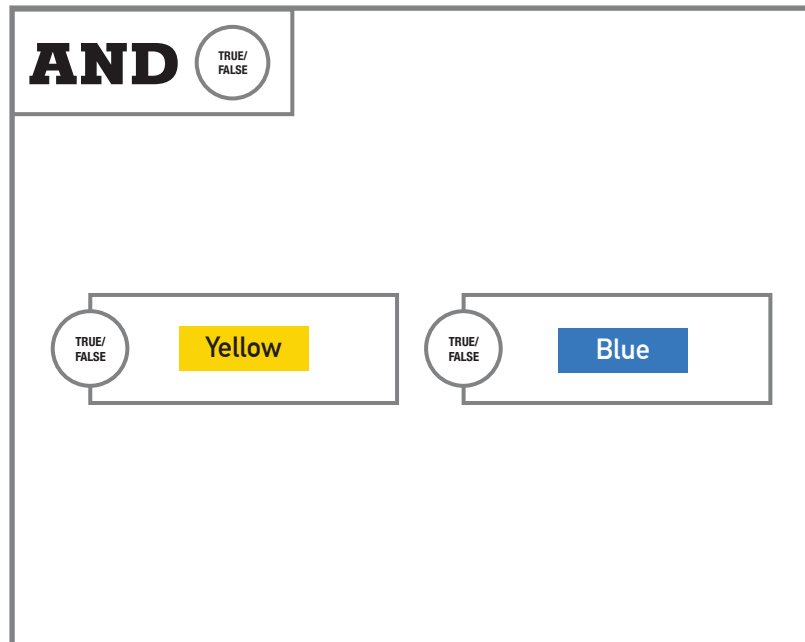




## Mini Challenge 01



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.



Logic Gates Used:

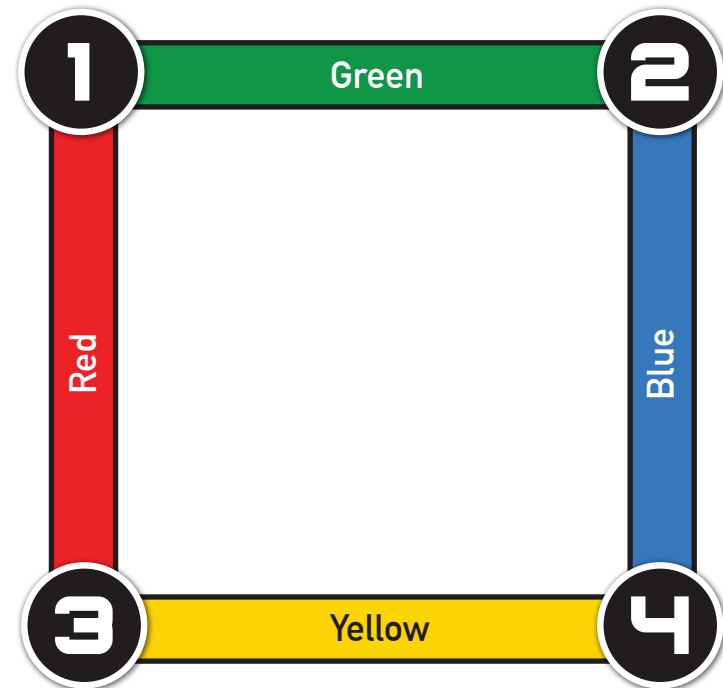
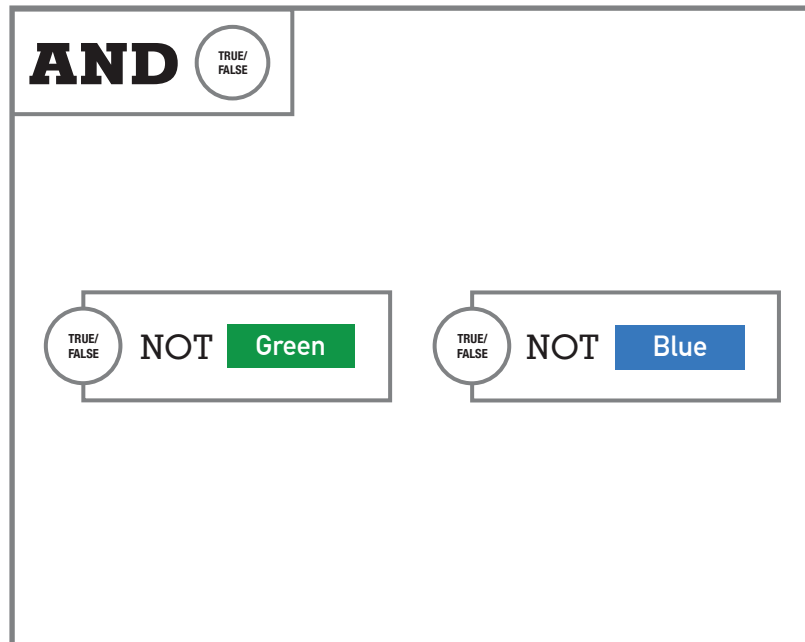
<b>AND</b>	All Clue Panels TRUE	1 or more
------------	----------------------	-----------



## Mini Challenge 02



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.

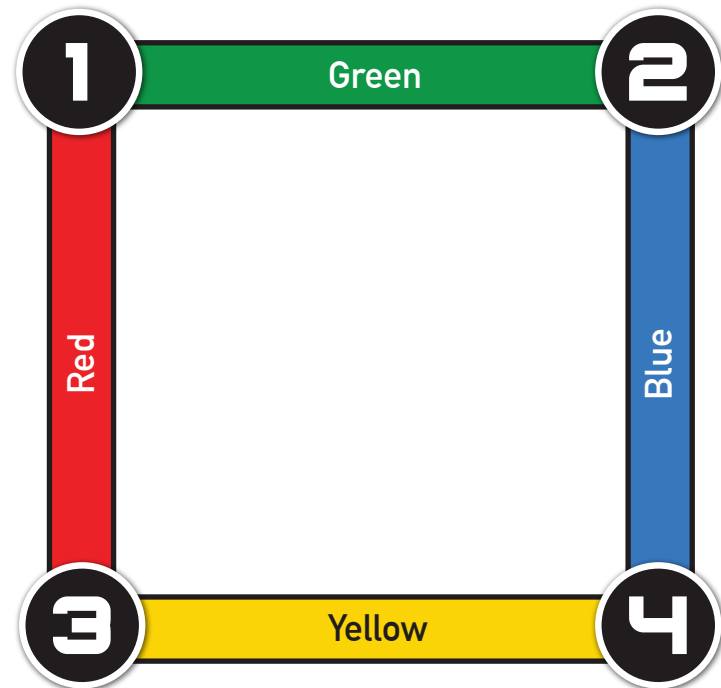
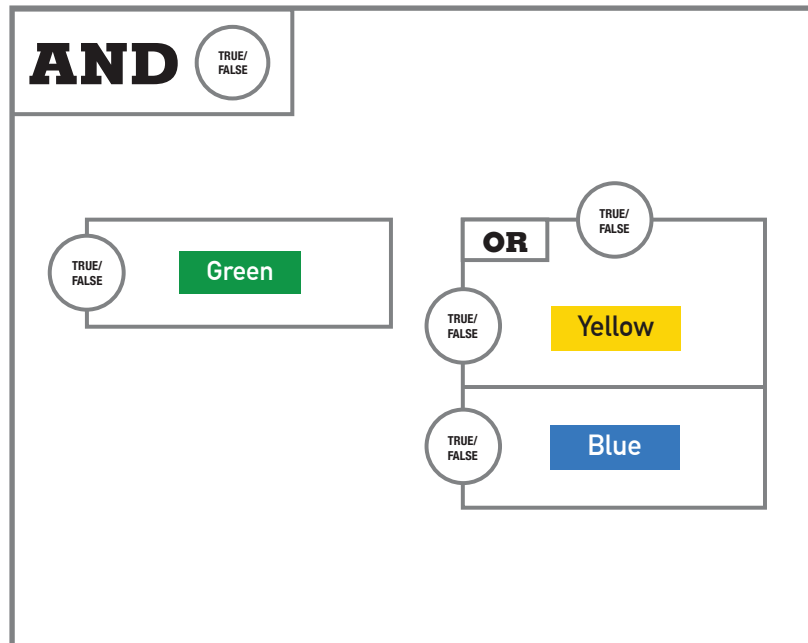


Logic Gates Used:

<b>AND</b>	All Clue Panels TRUE	1 or more
------------	----------------------	-----------



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.

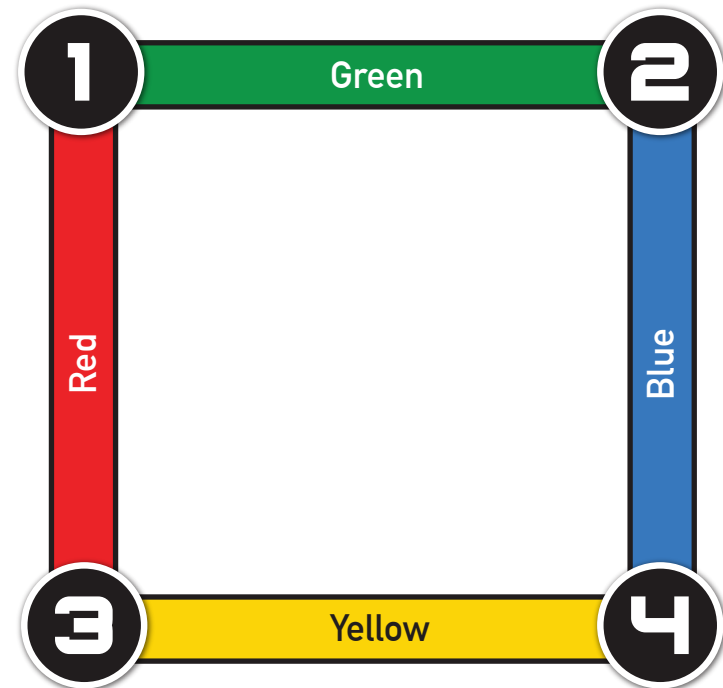
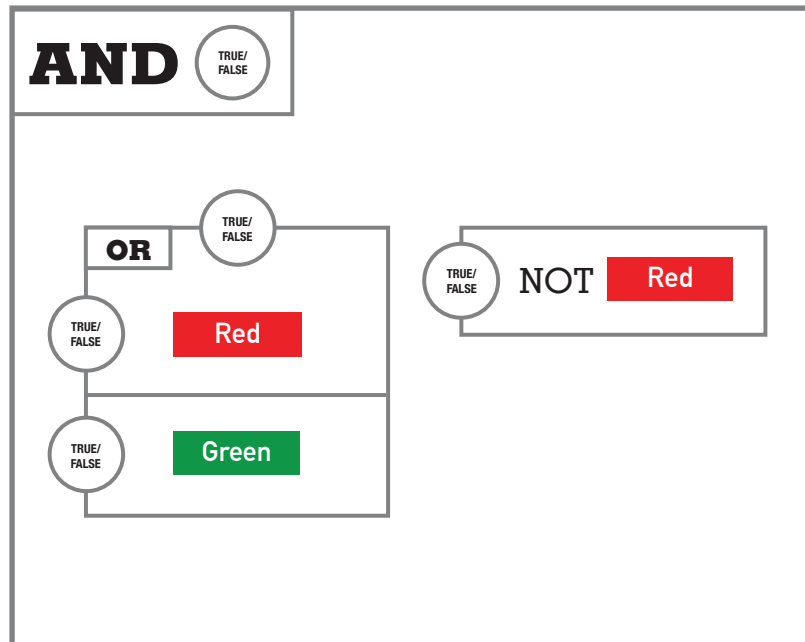


Logic Gates Used:

<b>OR</b>	At least 1 sensor TRUE	2 or more
-----------	------------------------	-----------



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.



Logic Gates Used:

<b>OR</b>	At least 1 sensor TRUE	2 or more
-----------	------------------------	-----------





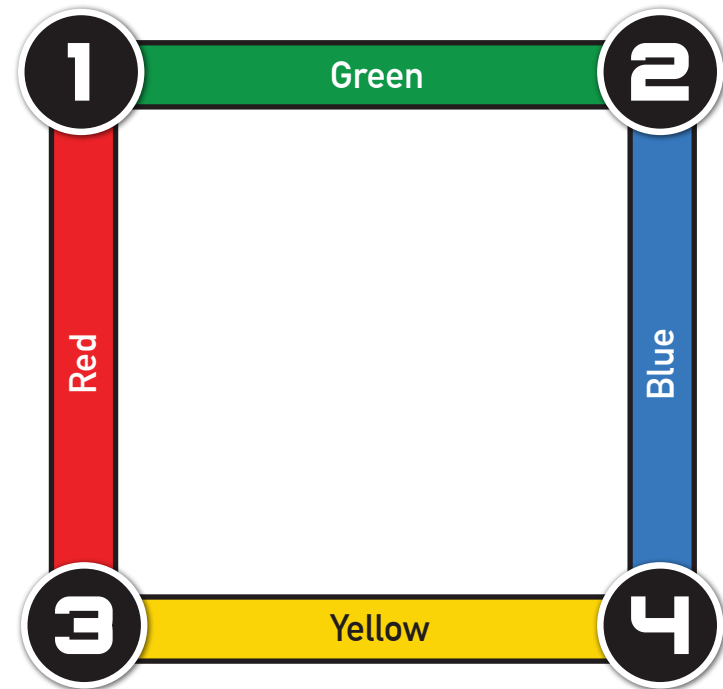
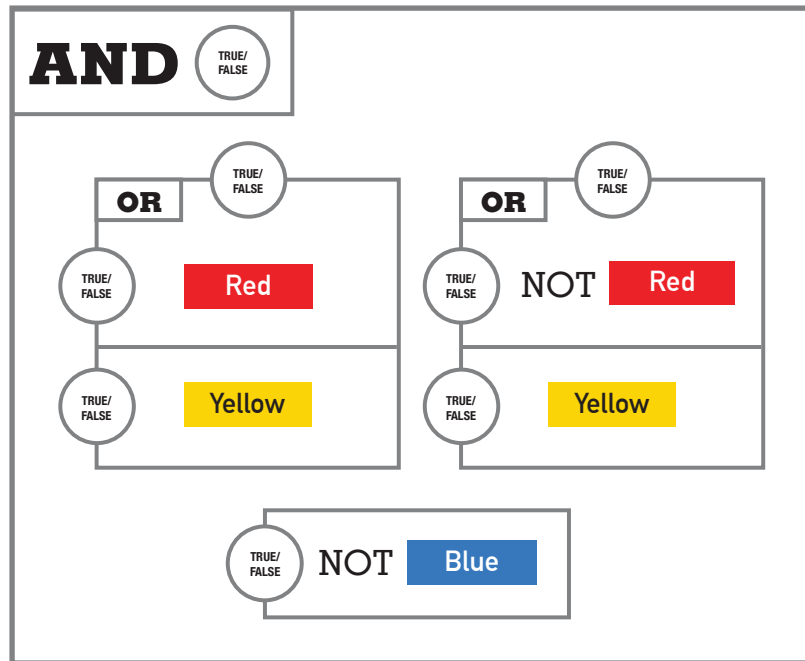
# //CODE ROBOT REPAIR

PROGRAMMING GAME SERIES //

## Mini Challenge 05



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.

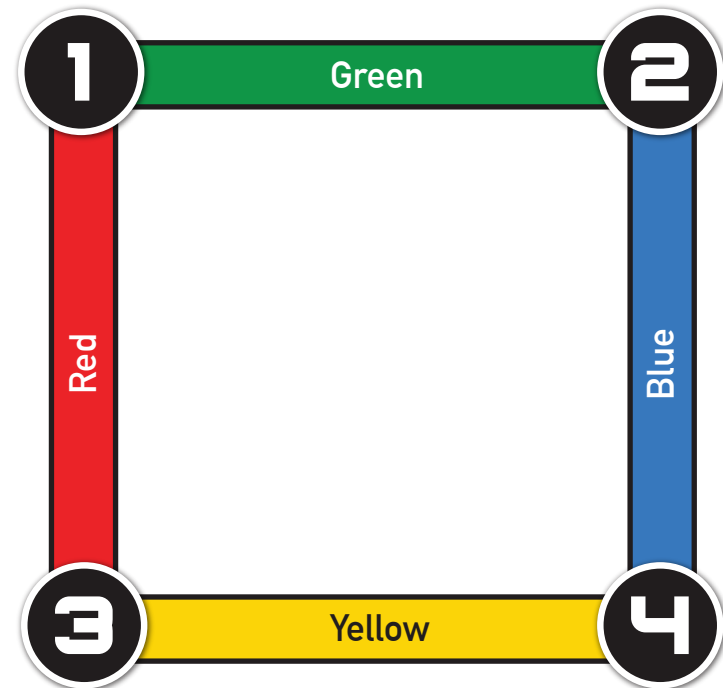
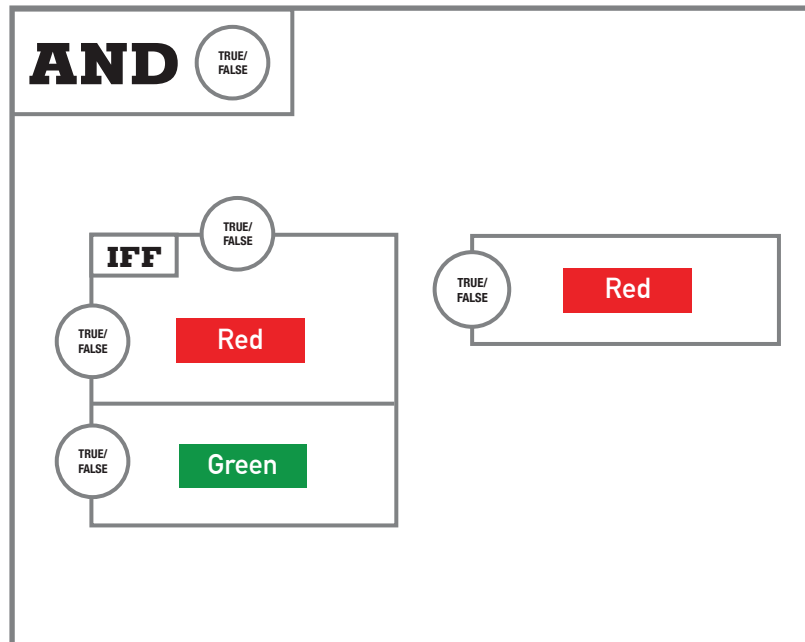


Logic Gates Used:

<b>OR</b>	At least 1 sensor TRUE	2 or more
-----------	------------------------	-----------



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.

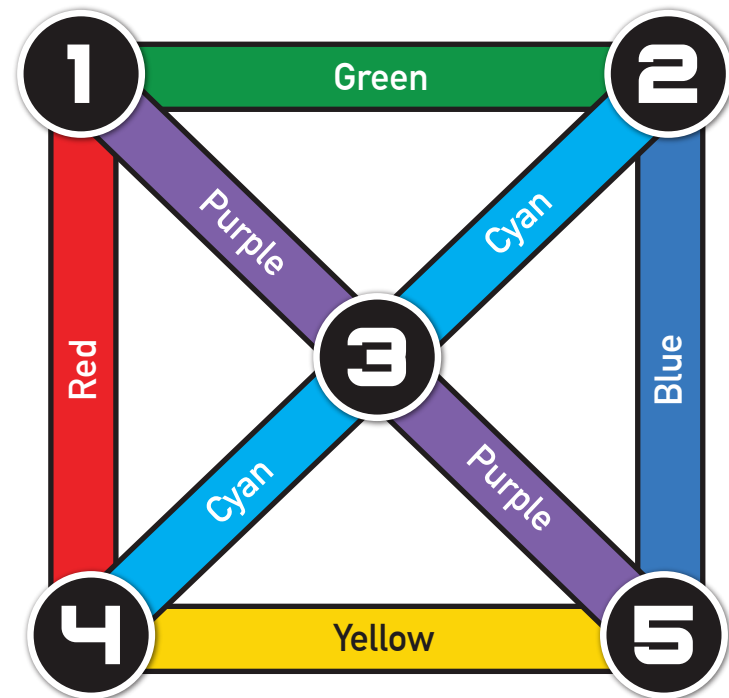
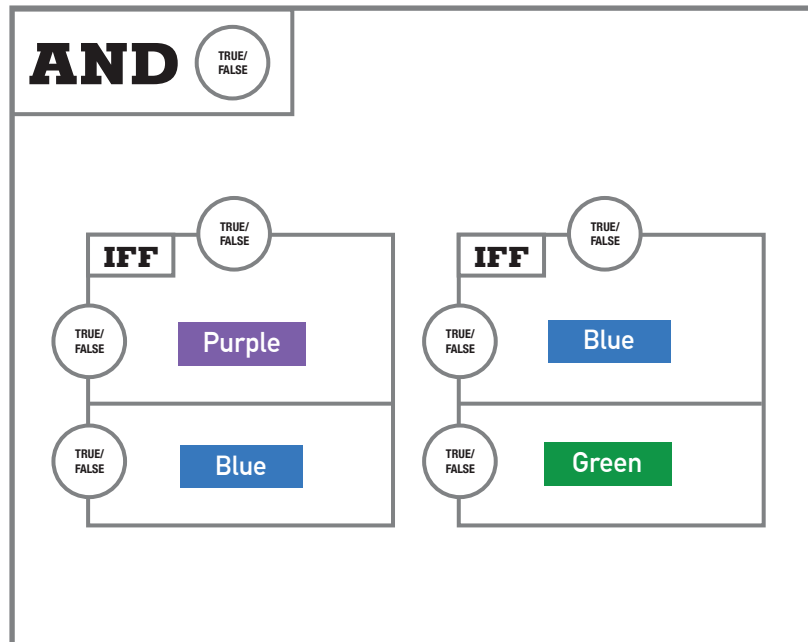


Logic Gates Used:

<b>IFF</b>	Both sensors TRUE or both sensors FALSE	Exactly 2
------------	--	-----------



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.



Logic Gates Used:

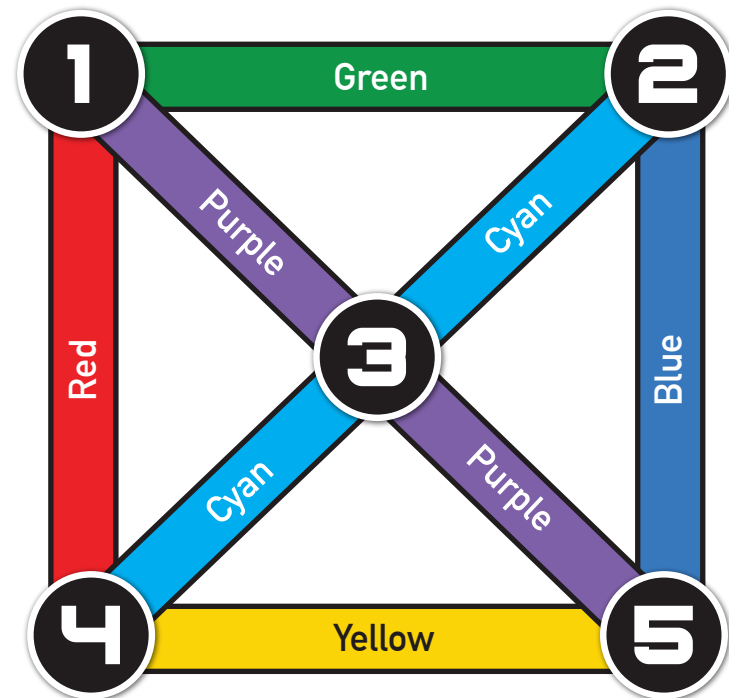
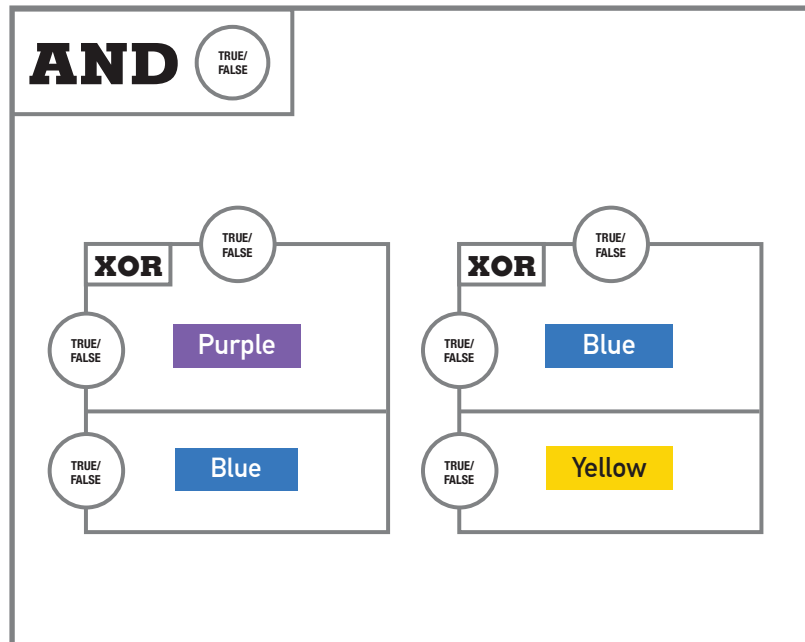
**IFF**

Both sensors TRUE  
or both sensors FALSE

Exactly 2



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.



Logic Gates Used:

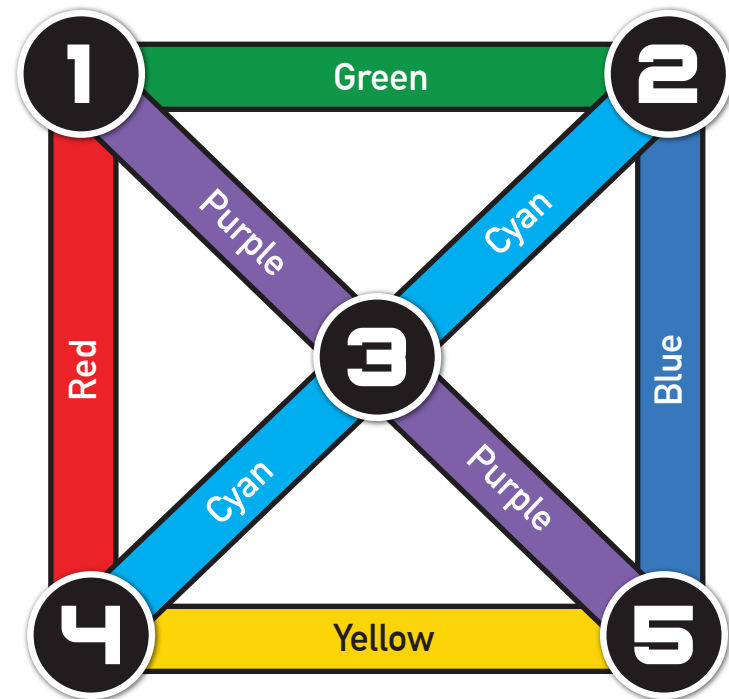
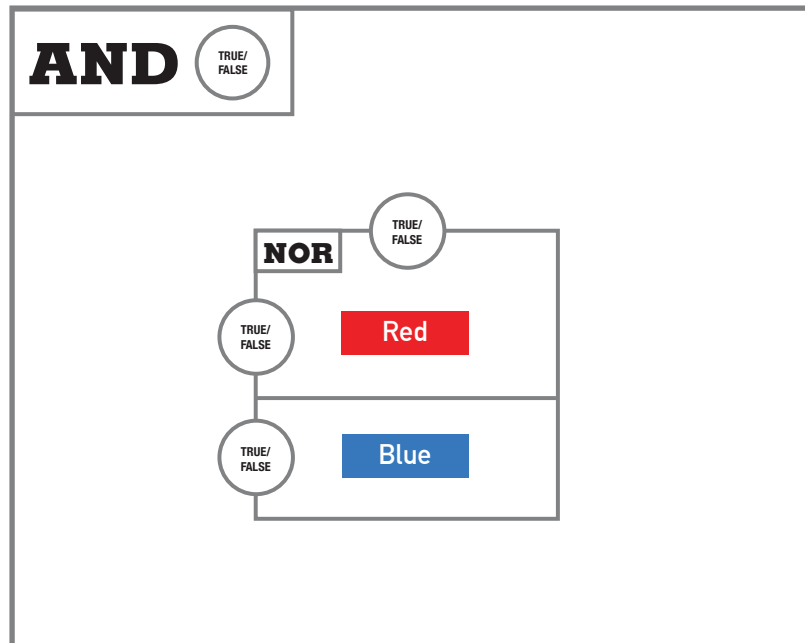
**XOR**

One sensor TRUE and  
one sensor FALSE

Exactly 2



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.

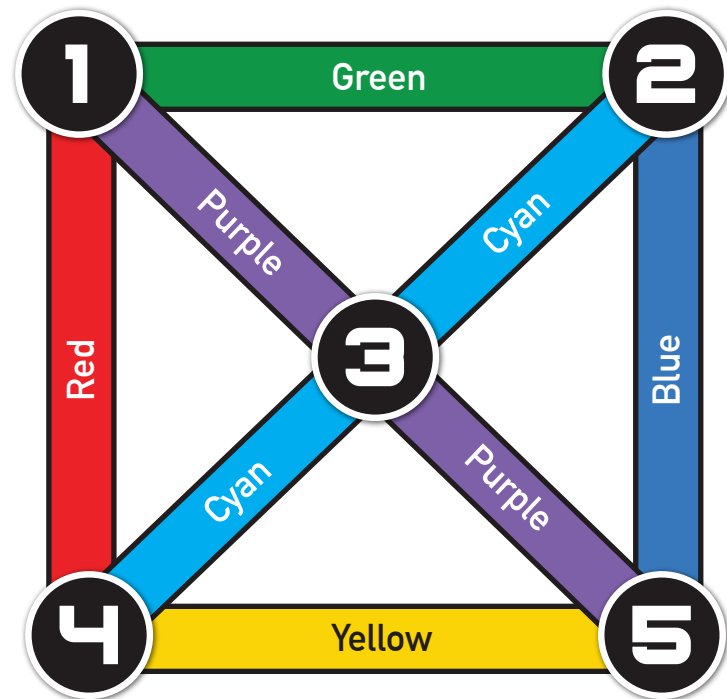
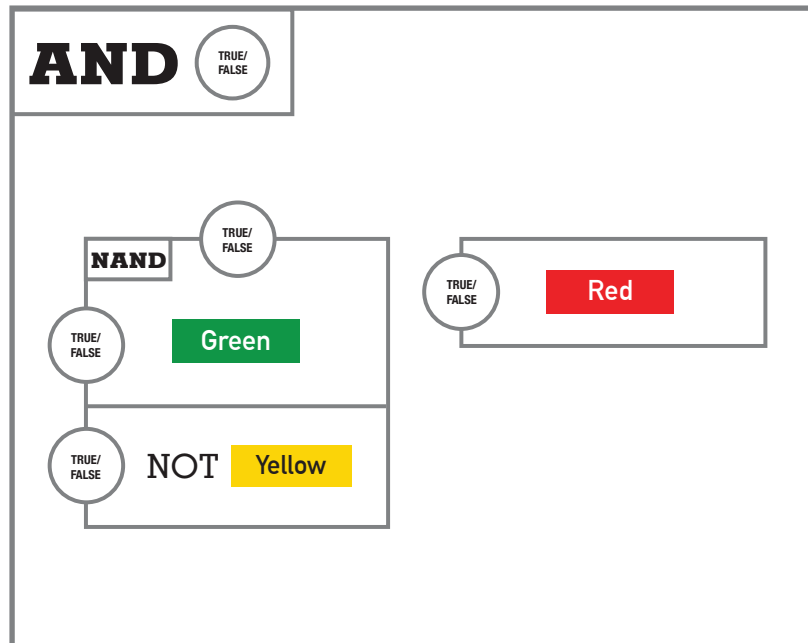


Logic Gates Used:

<b>NOR</b>	All sensors FALSE	2 or more
------------	-------------------	-----------



**TO SOLVE:** Place one power cell onto a numbered node to power the colored wires that make the Boolean expression TRUE.



Logic Gates Used:

**NAND**

At least 1 sensor FALSE

2 or more



CHALLENGE 01

4

CHALLENGE 02

3

CHALLENGE 03

2

CHALLENGE 04

2

CHALLENGE 05

3

CHALLENGE 06

1

CHALLENGE 07

4

CHALLENGE 08

2

CHALLENGE 09

3

CHALLENGE 10

4



# // CODE ROBOT REPAIR

PROGRAMMING GAME SERIES //

## Game Pieces

(cutting required)

