Science 9 Green Light - GO!! Circuit Superstar:

In this final project you will be building a functioning stop light using a combination of Micro:Bit coding and your understanding of circuits and circuit construction. The steps required to code you Micro:Bit are outlined below. After your Micro:Bit is programmed and functioning the science fun begins!!

**Coding and Setting up your Micro:Bit**

1. Using a laptop go to the website: [www.microbit.org](http://www.microbit.org)
2. Click on the "Let's Code" tab at the top of the webpage
3. Click on the yellow "Let's Code" button on the webpage
4. Go to Basic and choose "forever block"
5. Click on Advanced and go to Pins. Then select "digital write pin block" and place it inside the "forever block" and provide some delay, too. Delay is found the Basic tab. Select another "digital write pin block". We know 0 is low and 1 is high. So when we set PIN to 0, then it will turn off the light and when we set PIN 1 to 1, then it will turn on the light. This is the code for only one light; similarly we can code by changing the pins of the Micro:bit.



1. As this is for only one light (and remember there are 3 lights on a stop light – red, yellow and green) we will need to repeat the above coding for the remaining 2 lights. The fully finished code should look like this:



**Build your Traffic Light:**

1. Collect 10 wires
2. Connect a wire from the 0 pin on the Micro:Bit to a resistor. Add another wire from the resistor to a GREEN light.
3. Connect a wire from the GREEN light to the ground wire
4. Repeat steps 2 & 3 for RED and YELLOW lights
5. Connect the ground wire to the Ground Pin on the Micro:Bit

**Analysis of Traffic Light:**

1. Draw your traffic light using scientific symbols
2. How do you know you've made a circuit?
3. Indicate on your drawing, using colour, where series and parallel occur; highlight a simple circuit in a third colour

**Measurements of Your Traffic Light:**

1. What are the 3 variables in your traffic light?
2. Re-draw your traffic light, using scientific symbols and a separate piece of paper, to include all of the measurements. HINT: draw it very large, like full page large!
3. Using Ohm's Law, calculate the resistance of each resistor. How does your calculated resistance for each resistor compare to your measured resistances? Are they the same? Why or why not? Explain for each resistor. (Show your work below )

**Micro:Bit Intersection Challenge**

Build a working intersection where 4 cars will NOT crash. These cars will be driving towards the intersection from 4 different directions and arriving at the exact same time. Be sure to have the lights visible to the cars but also not a driving hazard. You will be given 2 Micro:Bits, 6 lights, wires, 4 toy cars and paper – you may use additional equipment if need be – clear it with your teacher first before you use it. Good luck!

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