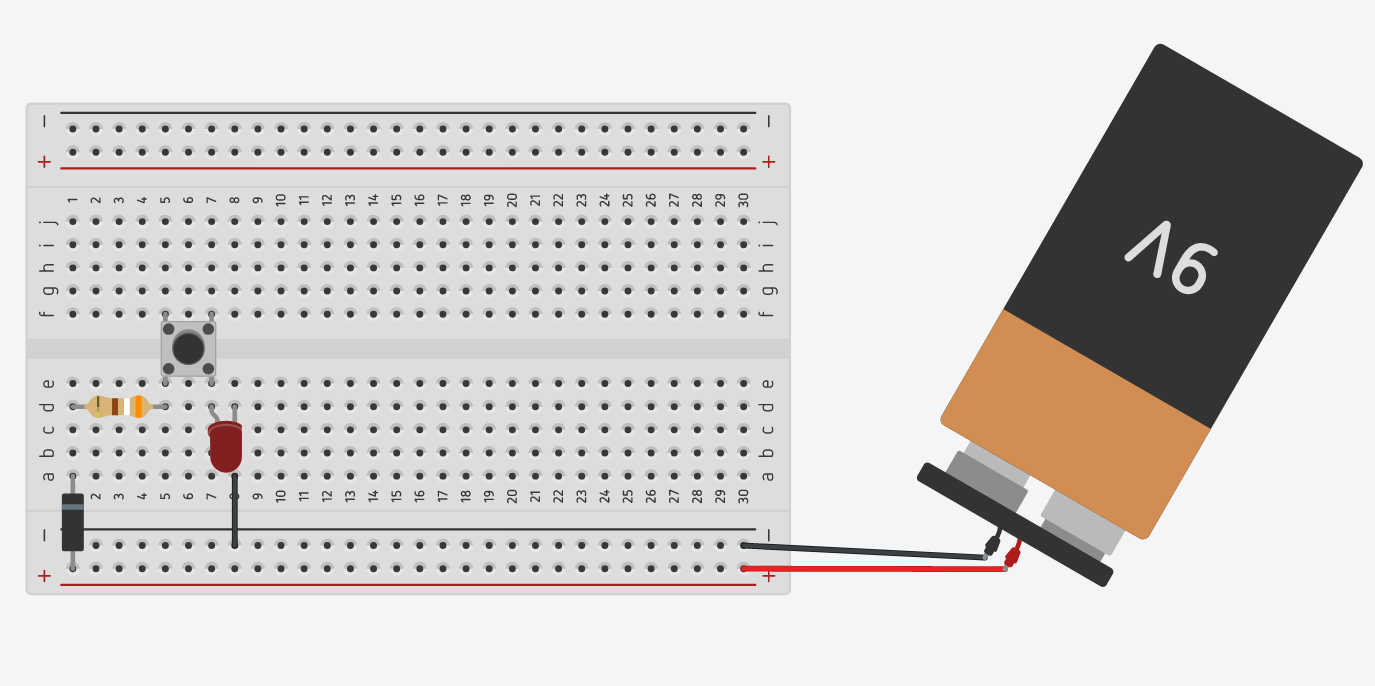
1. Complete the table to summarise the breadboard components. On page 7 there is a blank table to fill in any other components, problems and solutions you come across.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Component Name | Diagram | How it works | If my circuit isn’t working what could have gone wrong | What could I do to fix it |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | * Inside the board are many  strips of \_\_\_\_\_\_\_ that connect the rows and columns together. Rows are linked together but not across the divider. | * - Little metal clips on the inside aren’t working well * - Components were set up across the divider   - Components not set up horizontally in rows or vertically in columns | * - Try poking them with your finger or \_\_\_\_\_\_\_\_ it to a different section * - Make sure your components are linked to form a circuit. Pretend you are an electron and follow the path you would take |
| Hook up wire |  | * Insulated wire that is cut down and has the insulation pulled off * Use a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to pull the plastic end off the wire (it takes a few tries but then its really easy |  |  |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | * Resists the flow of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Can be placed in \_\_\_\_ direction * Use the resistor calculator on moodle to calculate the value of a resistor |  |  |
| Light emitting diode (LED) |  | * Turns current into light * Can only go in \_\_\_\_\_\_ direction (positive to negative) * The positive leg is longer * Always use a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | * LED will not work if it is placed \_\_\_\_\_\_\_\_\_\_\_\_\_ * LED **will \_\_\_\_\_\_\_ if not placed with a resistor** (at least 1.0K ohm) | * Try flipping the LED around * Always place LED with a resistor |
| Diode | diodes_diode | * only allow current to pass through them in \_\_\_\_\_ direction. * The arrowhead on the symbol shows the \_\_\_\_\_\_\_\_\_\_\_\_\_ of current flow. | * Will not allow to current to pass if it is placed backwards | * Try flipping the diode around |
| Capacitor | diodes_capacitor1 | * Stores charge * Maintain current for a short time * Can only be placed in \_\_\_\_\_\_\_\_\_ direction | * Will not allow to current to pass if it is placed backwards | * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Push button |  | * Connects two points in a circuit when you press it | * The pushbutton is square, and because of this it is  easy to put it in the wrong way | * Try giving it a 90 degree twist and see if it starts working. |
| Transistor | Screen%20Shot%202017-05-10%20at%2011.06.29%20am.png | * used to amplify or switch \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ signals and power |  |  |
| Power supply |  | * Regulates voltage supplied to breadboard – either 5V or  3.3V to power \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rails | * Switch not on * Voltage not being supplied * Input voltage not correct | * Switch on * Voltage set at 3V or 5V * Input voltage between 6.5-12V * Firmly pressed into power rails |
| Arduino Board |  | * Upload instructions (*\_\_\_\_\_\_\_\_\_*) to the board using the USB cable * The arduino board will perform the  instruction you uploaded | * Components and wires not connected correctly | * Look closely at your diagram instructions and make sure everything is connected just as it is in the picture |

**Project one – Goal: Get the light to turn on when you press the switch**



If it’s not working:

* Be patient
* Go through your troubleshooting steps
* See 3 before me
* Write your name on the whiteboard

Remember:

* You will get a learning merit if you complete a project
* You will get a NFOA merit for helping another student complete a project

***Bonus activity****: What happens if you connect the diode the other way around? Now try the resistor and LED.*

**Project 2 – Goal: Use the wires to touch something that conducts electricity. The LED should light up if what you are testing is a conductor**



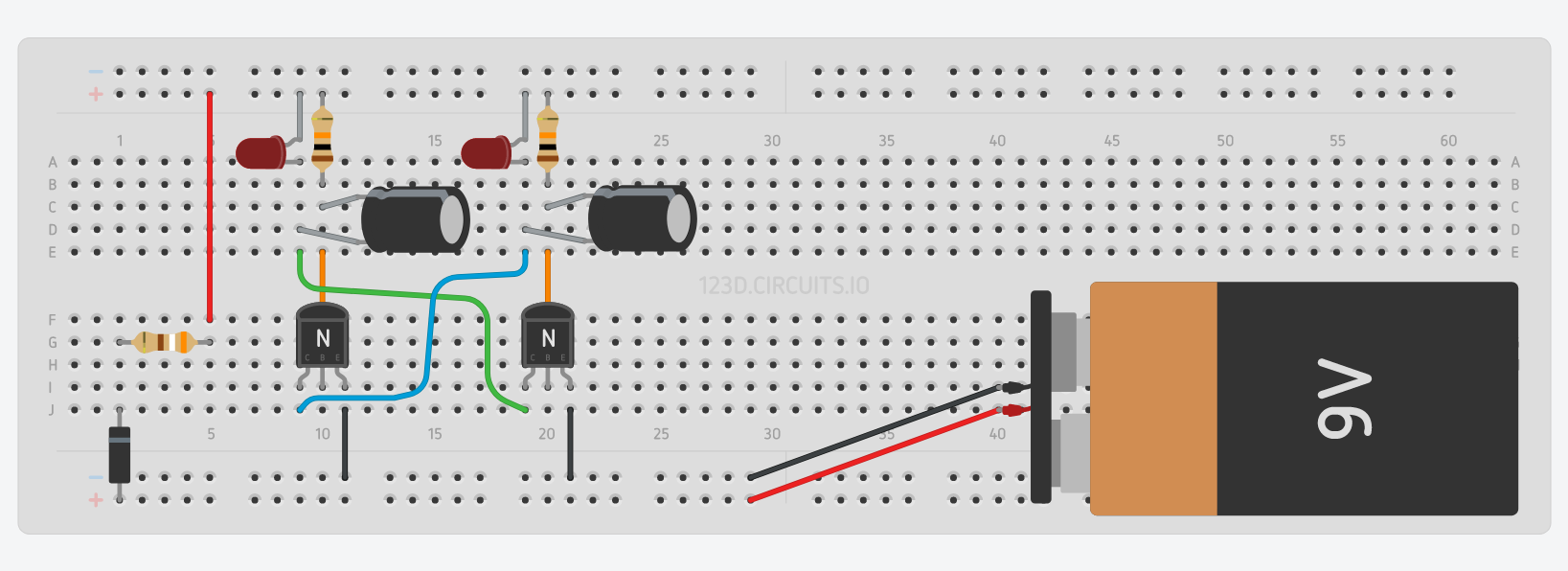
If it’s not working:

* Be patient
* Go through your troubleshooting steps
* See 3 before me
* Write your name on the whiteboard

Remember:

* You will get a learning merit if you complete a project
* You will get a NFOA merit for helping another student complete a project

**Project 3 – Goal: Get the lights to alternate switching on and off**



If it’s not working:

* Be patient
* Go through your troubleshooting steps
* See 3 before me
* Write your name on the whiteboard

Remember:

* You will get a learning merit if you complete a project
* You will get a NFOA merit for helping another student complete a project

***Bonus activity****: Can you control the LEDs by putting a switch in the circuit? What happens if you swap 100uF with 10uF capacitors?*

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **Problem** | **Solution** | **Extra Notes** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |