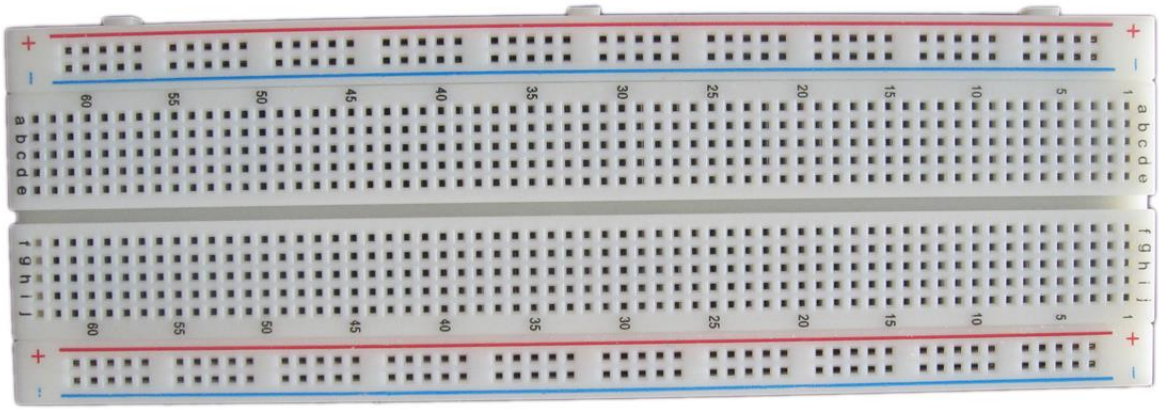
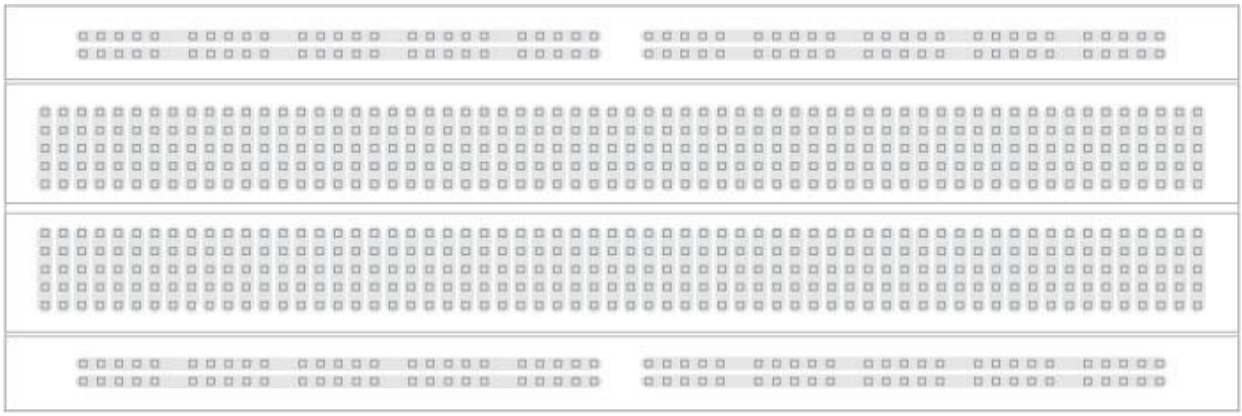
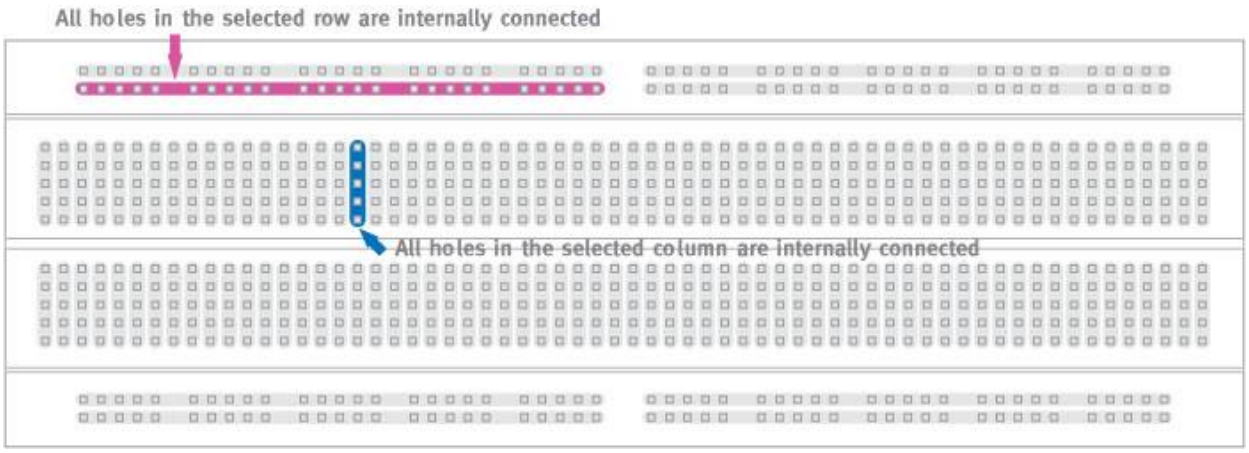
What is a breadboard?



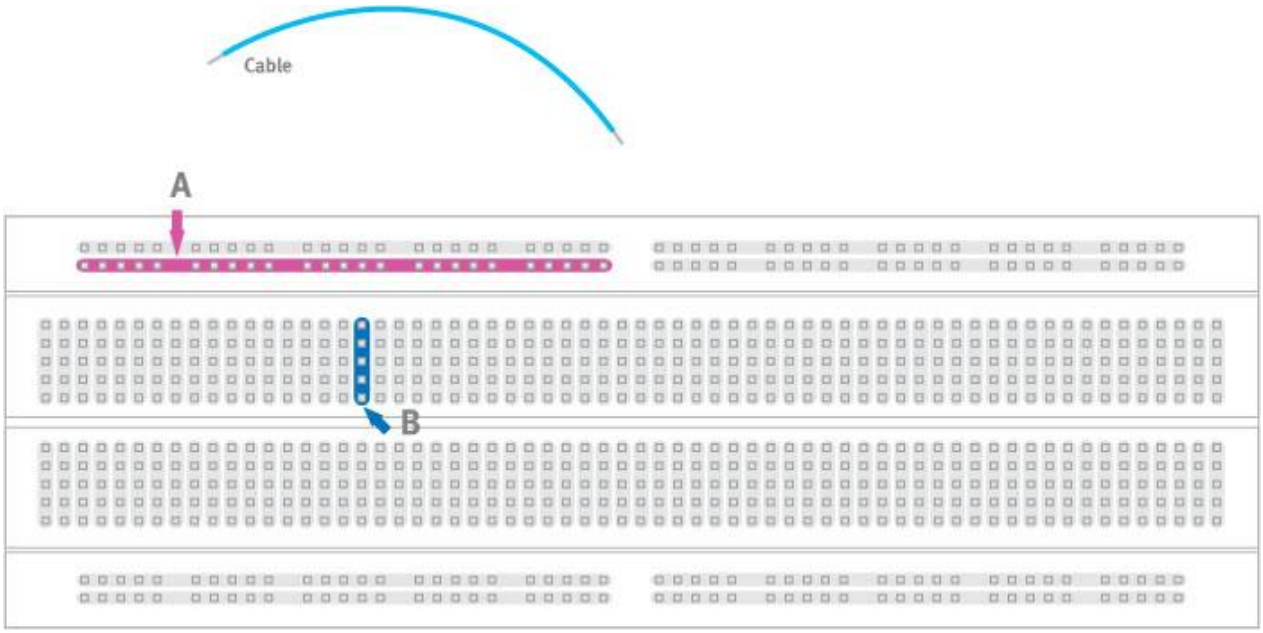
A breadboard is a **solderless** device for **temporary** prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate. The breadboard has strips of metal underneath the board and connect the holes on the top of the board. The metal strips are laid out as shown below. Note that the top and bottom rows of holes are connected horizontally and split in the middle while the remaining holes are connected vertically.



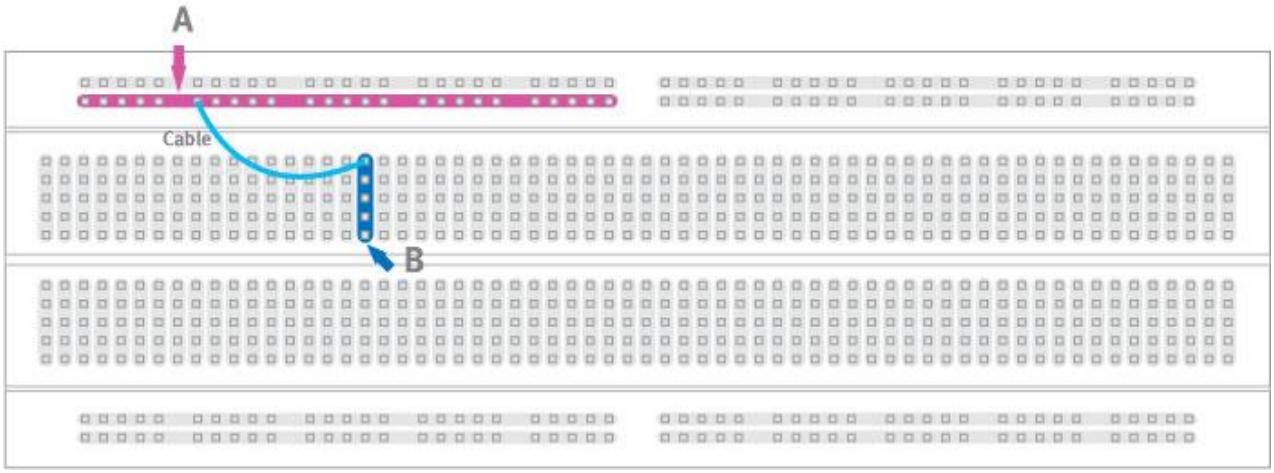
Note how all holes in the selected row are connected together, so the holes in the selected column. The set of connected holes can be called a node:



To interconnect the selected row (Node A) and column (node B) a cable going from any hole in the row to any hole in the column is needed:



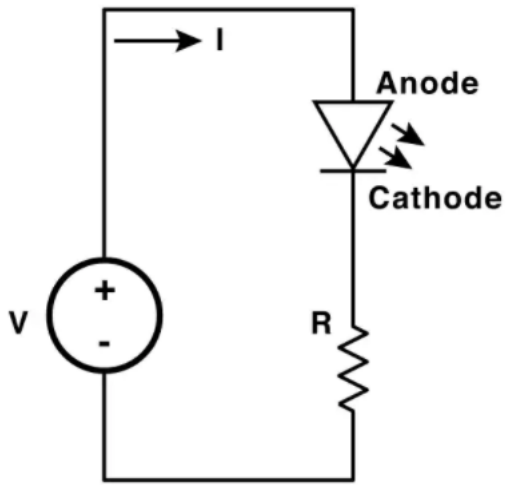
Now the selected column (node B) and row (Node A) are interconnected:



Resistor Calculating for LED

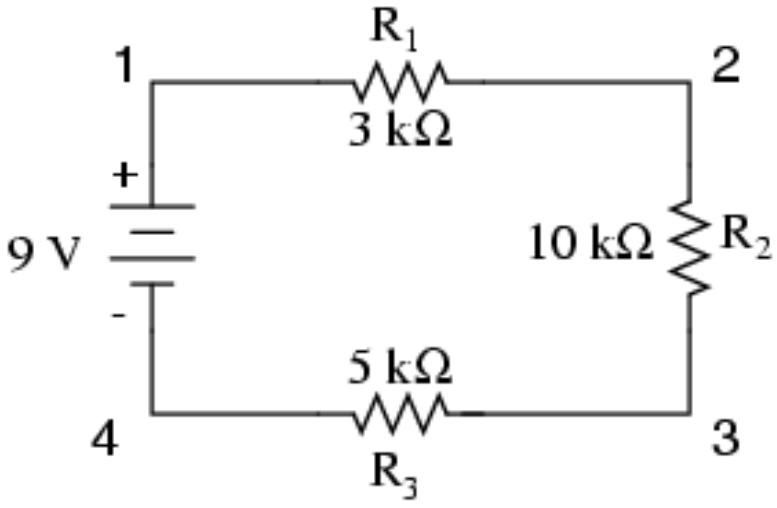
FORMULA

$$R = \frac{V_s - V_f}{I_f}$$

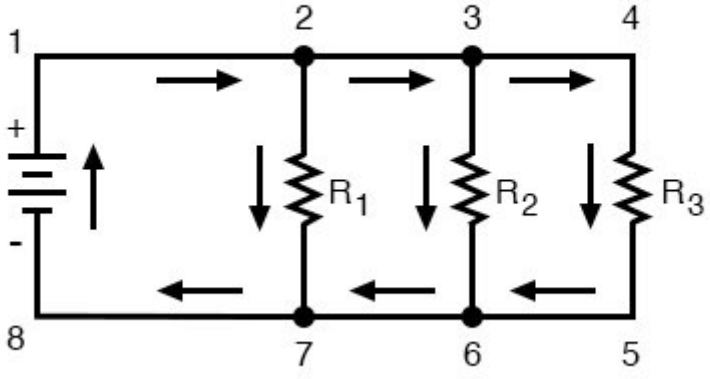


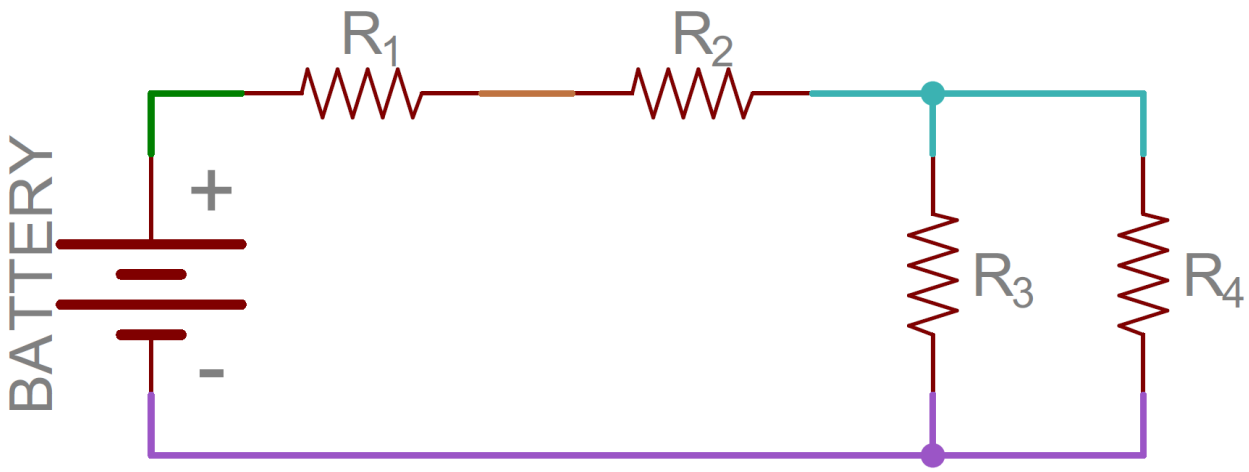
LED Color	Typical Vf Range
Red	1.8 to 2.1
Amber	2 to 2.2
Orange	1.9 to 2.2
Yellow	1.9 to 2.2
Green	2 to 3.1
Blue	3 to 3.7
White	3 to 3.4

Circuit Wiring in Breadboard using Tinkercad



Parallel




R1
R2
BATTERY
+
-
R3
R4