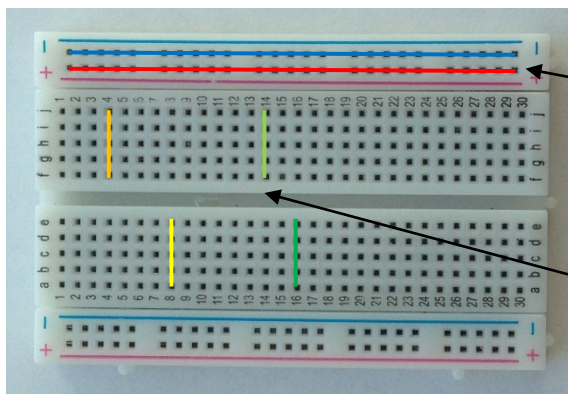


# TechResort Cheat Sheet

## Solderless Breadboards



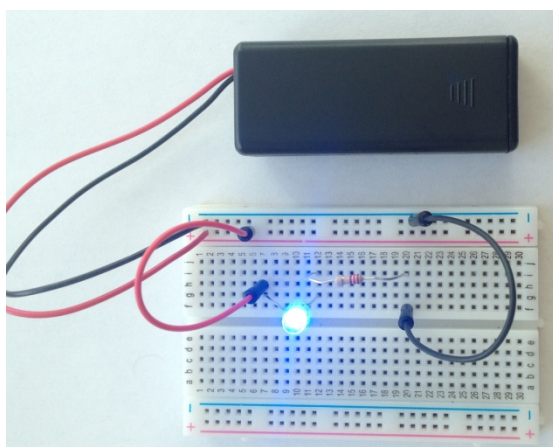
- “Solderless” Breadboards allow us to build electronic circuits quickly and easily without having to glue the parts together with hot metal.
- They also make it easy to modify and take apart our circuits and reuse the components we’ve used.
- The holes in the Breadboard are connected together internally so we can make electrical connections between components.
- There are usually two rows of holes down the sides of the breadboard labelled ‘+’ and ‘-’. The ‘+’ holes on each side are connected together vertically. Similarly with the ‘-’ holes.
- We’ll usually use these parts of the breadboard for the positive and negative power supplies for our circuit – usually the black and red wires from a battery pack or other circuit. But you don’t have to: it’s not compulsory!!
- The numbered rows form groups of connected holes. Those with the same number are connected together but connections do not bridge the big gap down the middle.



Rows of holes labelled ‘+’ and ‘-’ connected together as indicated by red and blue lines

Rows of holes labelled with numbers connected together as indicated by other coloured lines

- Here’s an LED circuit wired up using a breadboard:



- The positive (red) and negative (black) battery wires are connected to the ‘+’ and ‘-’ rows respectively
- The red jumper cable connects the positive voltage to row 7
- The positive leg of the LED is in row 7
- The negative leg of the LED is in row 12
- The resistor is connected between rows 12 and 20
- The black jumper cable connects row 20 to the negative voltage