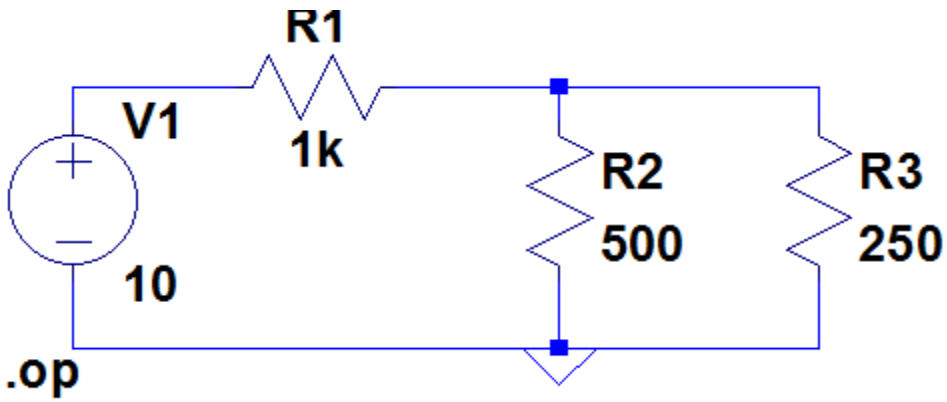
Experiment No.1 **Date:14/09/2021**

Make Circuits on Breadboard

Aim:

To learn to make circuits on breadboard on www.tinkercad.com



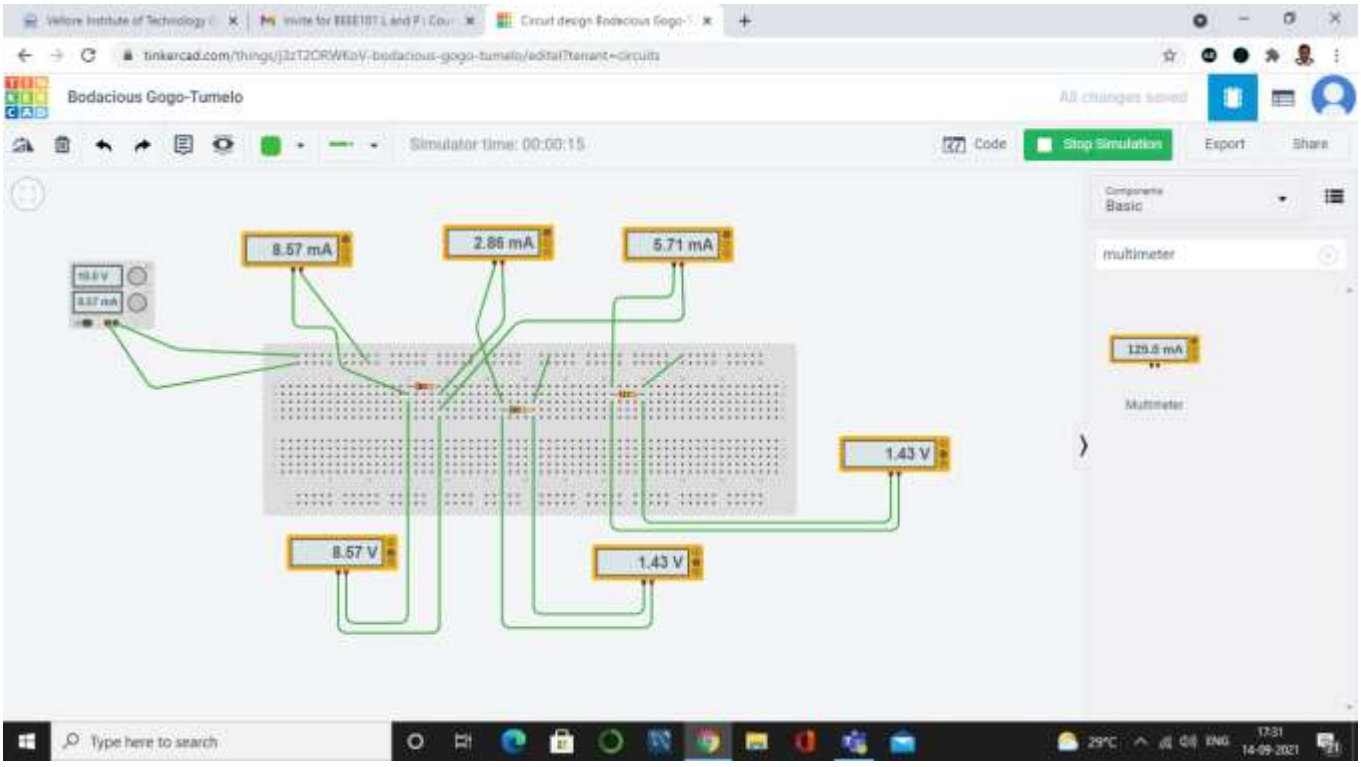
Observation:

Voltage and Current Measurements

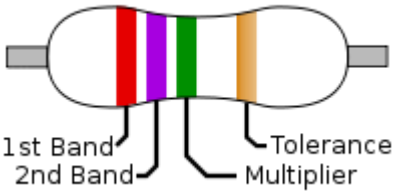
S.No	Parameter to be measured	Value Measured with Units
1	Voltage across R1	8.57 V
2	Voltage across R2	1.43 V
3	Voltage across R3	1.43 V
4	Current through R1	8.57 mA
5	Current through R2	2.86 mA
6	Current through R3	5.71 mA

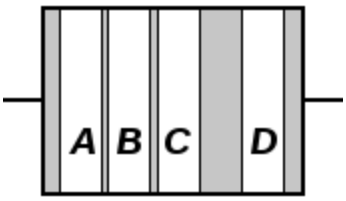
Sharable link of the Simulation

Screenshot of Simulation done in TinkerCAD



RESISTOR COLOUR CODES





Color	Significant figures	Multiplier	Tolerance		Temp. Coefficient (ppm/K)	
Black	0	$\times 10^0$	–		250	U
Brown	1	$\times 10^1$	±1%	F	100	S
Red	2	$\times 10^2$	±2%	G	50	R
Orange	3	$\times 10^3$	–		15	P
Yellow	4	$\times 10^4$	–		25	Q
Green	5	$\times 10^5$	±0.5%	D	20	Z
Blue	6	$\times 10^6$	±0.25%	C	10	Z
Violet	7	$\times 10^7$	±0.1%	B	5	M
Gray	8	$\times 10^8$	±0.05%	A	1	K
White	9	$\times 10^9$	–		–	
Gold	–	$\times 10^{-1}$	±5%	J	–	
Silver	–	$\times 10^{-2}$	±10%	K	–	

None	–	–	±20%	M	–

1. Any temperature coefficent not assigned its own letter shall be markd "Z", and the coefficient found in other documentation.
2. For more information, see EN 60062.

Resistor values are always coded in ohms. Band **A** is first significant figure of component value. Band **B** is the second significant figure. Band **C** is the decimal multiplier. Band **D** if present, indicates tolerance of value in percent (no color means 20%).The standard color code per **EN 60062:**2005 is as follows:

For example, a resistor with bands of ***yellow, violet, red, and gold*** will have first digit 4 (yellow in table below), second digit 7 (violet), followed by 2 (red) zeros: 4,700 ohms. Gold signifies that the tolerance is ±5%, so the real resistance could lie anywhere between 4,465 and 4,935 ohms.

Tight tolerance resistors may have three bands for significant figures rather than two, and/or an additional band indicating **temperature coefficient**, in units of **ppm/K**. All coded components will have at least two value bands and a multiplier; other bands are optional.

As an example, let us take a resistor which (read left to right) displays the colors ***yellow, violet, yellow, brown***. We take the first two bands as the value, giving us *4, 7*. Then the third band, another *yellow*, gives us the multiplier 10^4. Our total value is then $47 \times 10^4\ \Omega$, totalling *470,000 Ω* or *470 kΩ*. Our brown is then a tolerance of ±1%.

Breadboard Connections