

# Introduction

The first experiment makes introduction to the electronic circuits and their components, the main objective of this experiment is to be familiar with the major components that we are going to use in all lab experiments, like the electronic boards and the digital multimeter (DMM).

**This experiment consists of three parts.**

- ✓ Resistance Measurement.
- ✓ Voltage Measurement.
- ✓ Current Measurement.

## Procedure

### ☒ Part one (Resistance Measurement)

1. we connected the resistance with the digital multimeter (as shown in Fig 1 ).

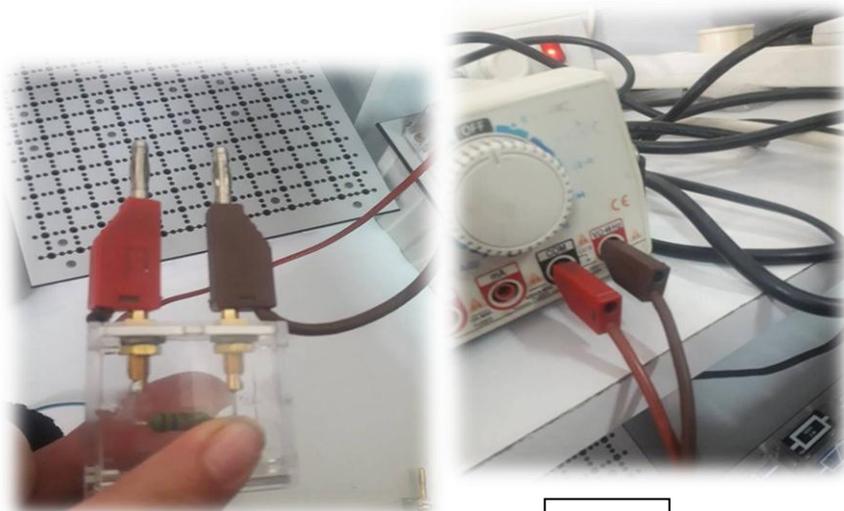
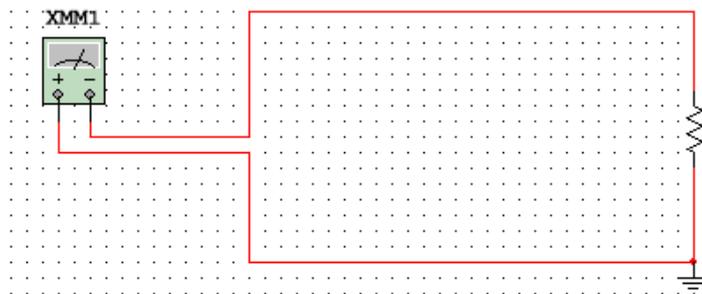


Fig.1

2. we defenite resistors, then measured the resistance related to each resistor by DMM and we tabled the results in table 1
3. we were choosing the unit or the magnitude for DMM to be the first choice on the device having a magnitude bigger than which we have .

## Results And Questions

<b>R</b>	<b>100</b>	<b>220</b>	<b>330</b>	<b>470</b>	<b>680</b>	<b>1000</b>
<b>Resistance</b>	<b>90.1</b>	<b>218.2</b>	<b>330</b>	<b>463</b>	<b>668</b>	<b>981</b>

**Table 1**

☒ The resistance can also be calculated using the color .

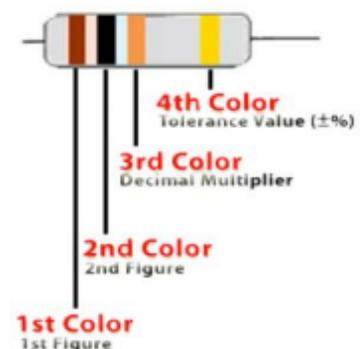
Color	Code	Color	Code
Black	0	Blue	6
Brown	1	Violet	7
Red	2	Gray	8
Orange	3	White	9
Yellow	4	Gold	5%
Green	5	Silver	10%

The value of a resistor is:

$$R \text{ (Ohm)} = AB * 10^C \pm D$$

Such that,

- A: the 1<sup>st</sup> color band from left.
- B: the 2<sup>nd</sup> color band to the right of A.
- C: the 3<sup>rd</sup> color band to the right of B.
- D: the tolerance value.



☒ standard values for carbon resistors.

Standard Resistor Values ( $\pm 5\%$ )						
1.0	10	100	1.0K	10K	100K	1.0M
1.1	11	110	1.1K	11K	110K	1.1M
1.2	12	120	1.2K	12K	120K	1.2M
1.3	13	130	1.3K	13K	130K	1.3M
1.5	15	150	1.5K	15K	150K	1.5M
1.6	16	160	1.6K	16K	160K	1.6M
1.8	18	180	1.8K	18K	180K	1.8M
2.0	20	200	2.0K	20K	200K	2.0M
2.2	22	220	2.2K	22K	220K	2.2M
2.4	24	240	2.4K	24K	240K	2.4M
2.7	27	270	2.7K	27K	270K	2.7M
3.0	30	300	3.0K	30K	300K	3.0M
3.3	33	330	3.3K	33K	330K	3.3M
3.6	36	360	3.6K	36K	360K	3.6M
3.9	39	390	3.9K	39K	390K	3.9M
4.3	43	430	4.3K	43K	430K	4.3M
4.7	47	470	4.7K	47K	470K	4.7M
5.1	51	510	5.1K	51K	510K	5.1M
5.6	56	560	5.6K	56K	560K	5.6M
6.2	62	620	6.2K	62K	620K	6.2M
6.8	68	680	6.8K	68K	680K	6.8M
7.5	75	750	7.5K	75K	750K	7.5M
8.2	82	820	8.2K	82K	820K	8.2M
9.1	91	910	9.1K	91K	910K	9.1M

☒ Part two (Voltage Measurement)

1. We Connected the DMM directly with the variable voltage source on the board that varies from 0-30 V (as shown in Fig 2).

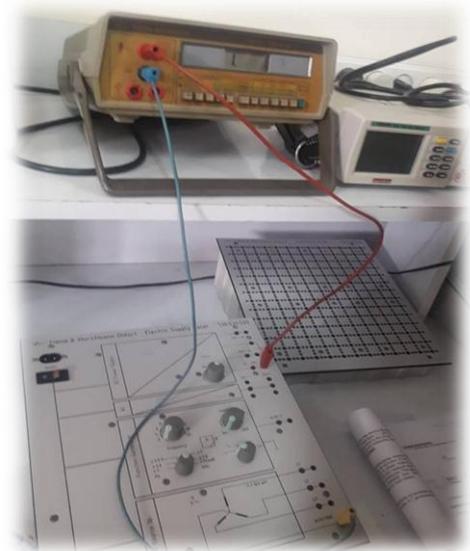
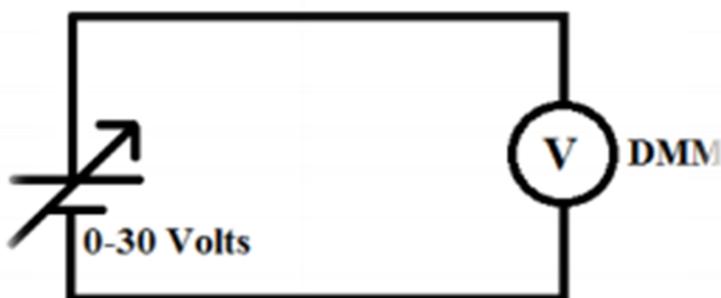


Fig 2

2. We Estimated the values of voltages that exist in the table and we checked the exact voltage value on the voltmeter (see table2).

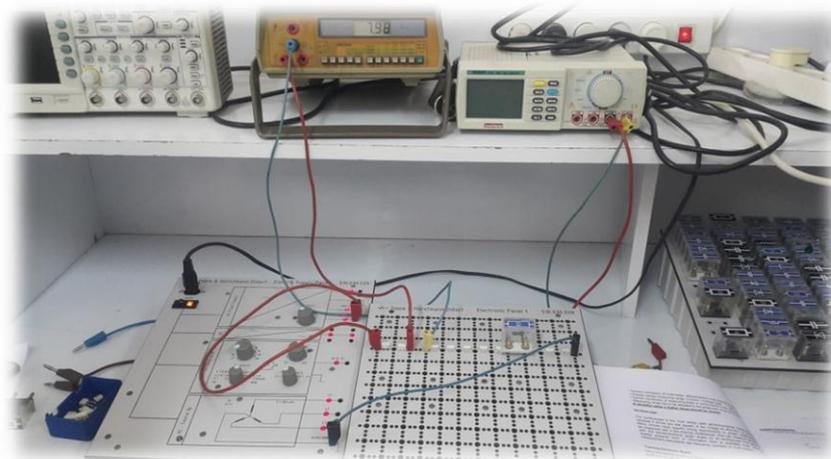
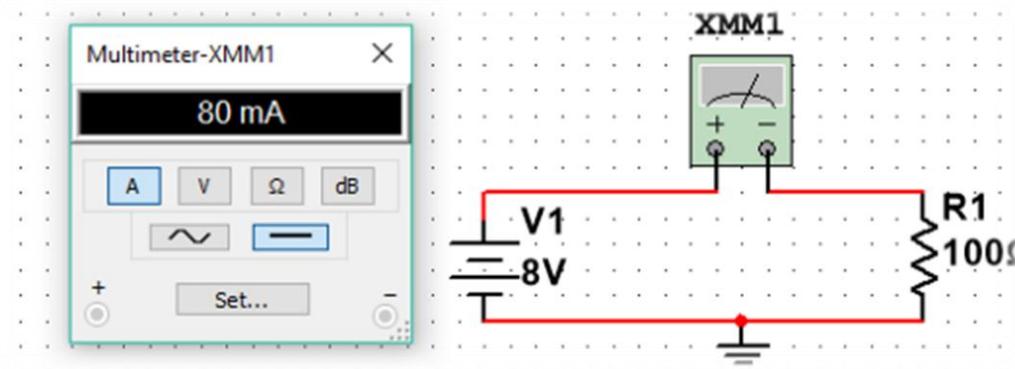
## Results

Setting	0	1/4	1/2	3/4	1
voltage	0.01	6.33	13.31	21	30.7

**Table2**

### ☒ Part three (current Measurement)

1. We Chose a specific voltage on the board(as we me Mentioned before).
2. We connected the circuit( as shown in Fig3), by using the board, DMM(Ammeter) and resistance.



**Fig 3**

3. Noticed that the Ammeter is connected in series with the circuit.
4. We read the current and we tabled the results in Table 3 and 4.

## Results

**At v = 8 volt**

R(ideal)	100	220	330	470	680	1000
Current Measured(mA)	86	36	23.7	16.9	11.7	7.99
Current calculated(mA)	80	36.3	24.3	17.02	11.76	8

**Table 3**

**At v = 12 volt**

R(ideal)	100	220	330	470	680	1000
Current Measured(mm)	128.5	54.4	35.9	25.6	17.7	12
Current calculated(mA)	120	54.5	36.36	25.5	17.6	12

**Table 4**

## Conclusion

At the end of this experiment we have learned how to use the tools that we are going to use later, we also learned how to read the results from the screens of electrical devices and how to connect the circuit. Finally, how to use the law of ohm to find the current or voltages or resistance through the relationship  $V= I * R$ .