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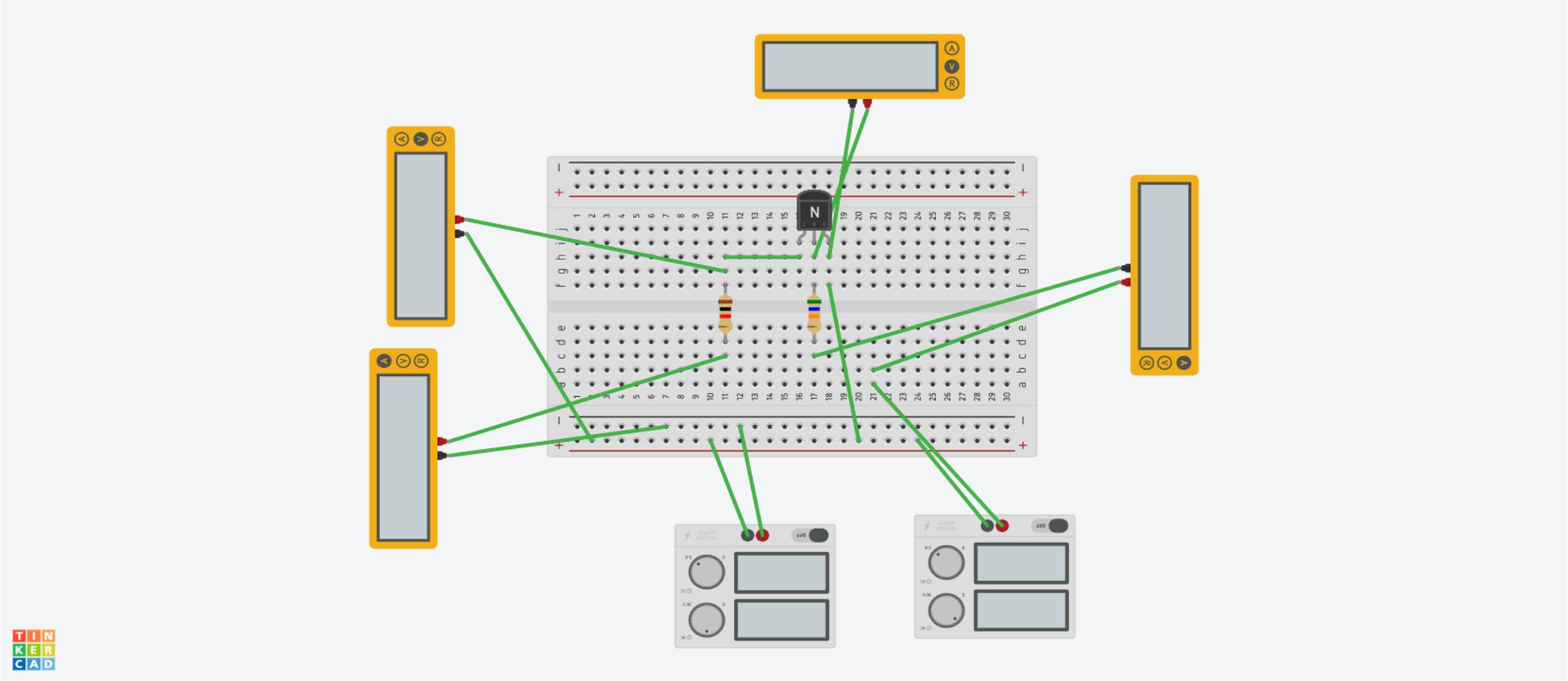
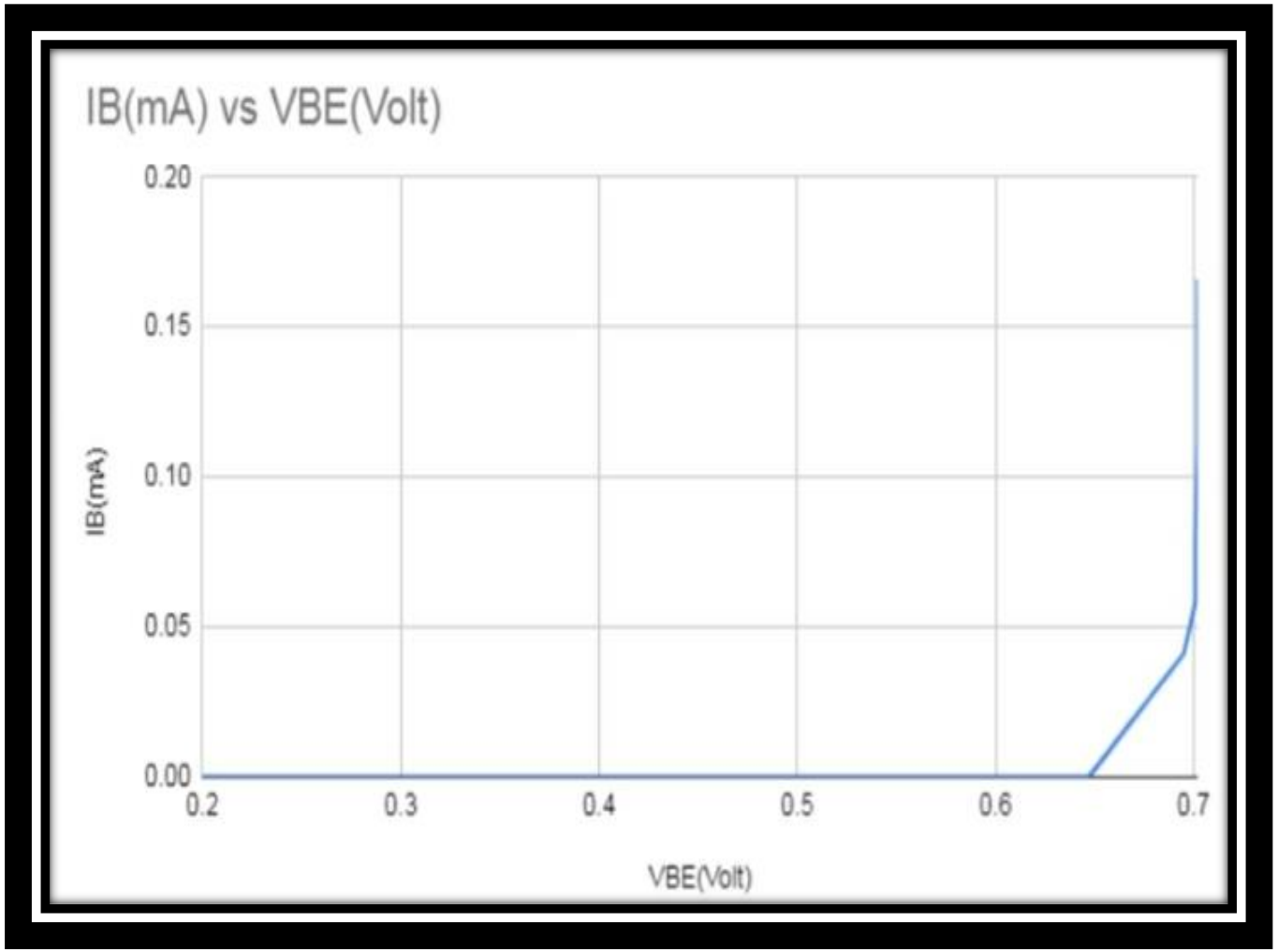
EXPERIMENT NO. : 4

- Task 1: Consider the following configuration of the BJT and find the base curve. To vary the base current change the VBB in the range of 0.1V to 10V.Consider VBB=10V



V	VBE(Volt)	IB(mA)
0.1	0.2	0
0.2	0.2	0
0.5	0.577	0
0.8	0.628	0
1	0.647	0
3	0.695	0.0412
4	0.701	0.0589
5	0.701	0.0768
7	0.702	0.112
9	0.702	0.148
10	0.702	0.166

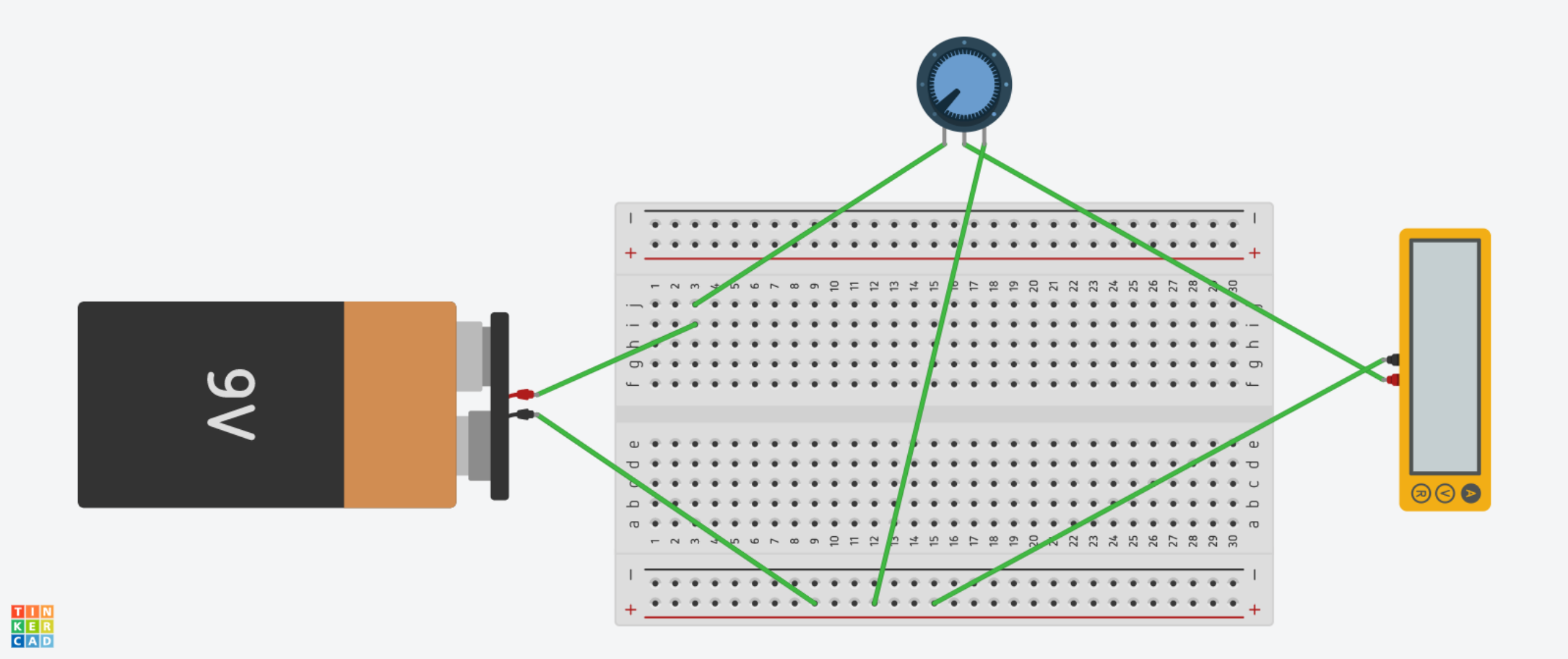


Task 2: Assume that variable DC supply is not available. How will you vary the IB?

- In the given situation when we don’t have variable dc supply we will

Vary the ib current using RB resistor.

Task 3: Get information about Potentiometer.Connect potentiometer across 9V battery and see the impact of resistance over the current in the circuit. Will it be helpful anyway?



- A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an

adjustable voltage divider.If only two terminals are used, one end and the wiper, it acts as a variable

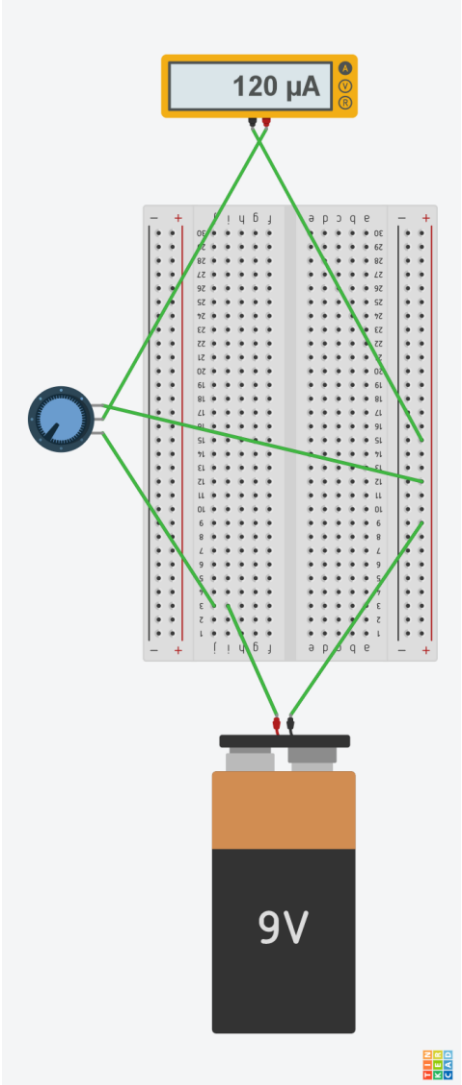
resistor or rheostat.

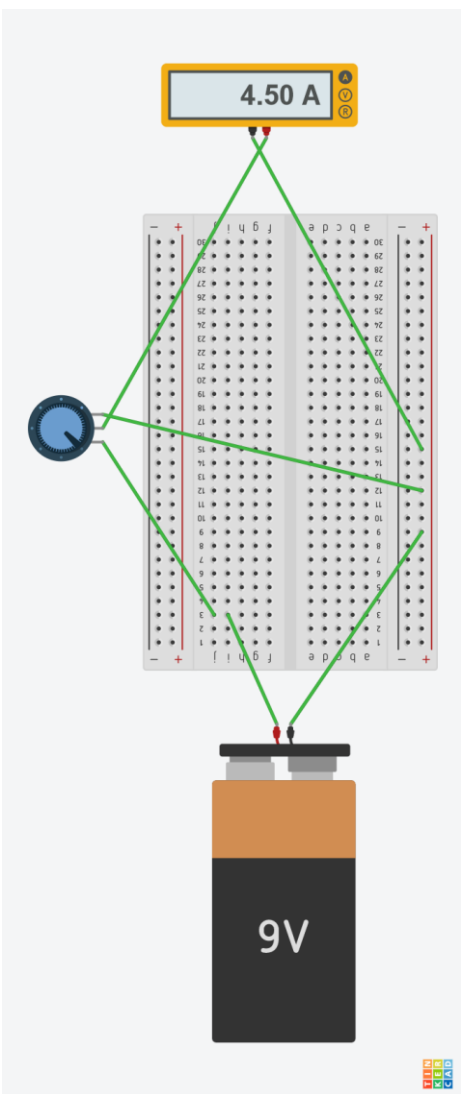
- The measuring instrument called a potentiometer is essentially a voltage divider used for

measuring voltage

- Potentiometers are commonly used to control electrical devices such as volume controls on audio equipment.
- Yes,Potentiometer will be helpful for plotting the base

curve when variable DC power supply is unavailable.

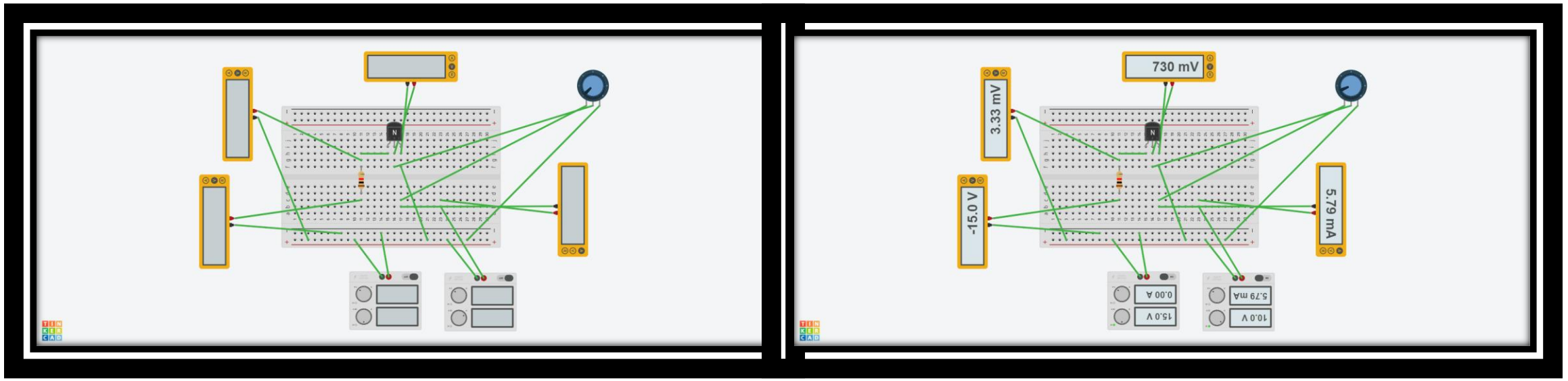

120 µA
9V

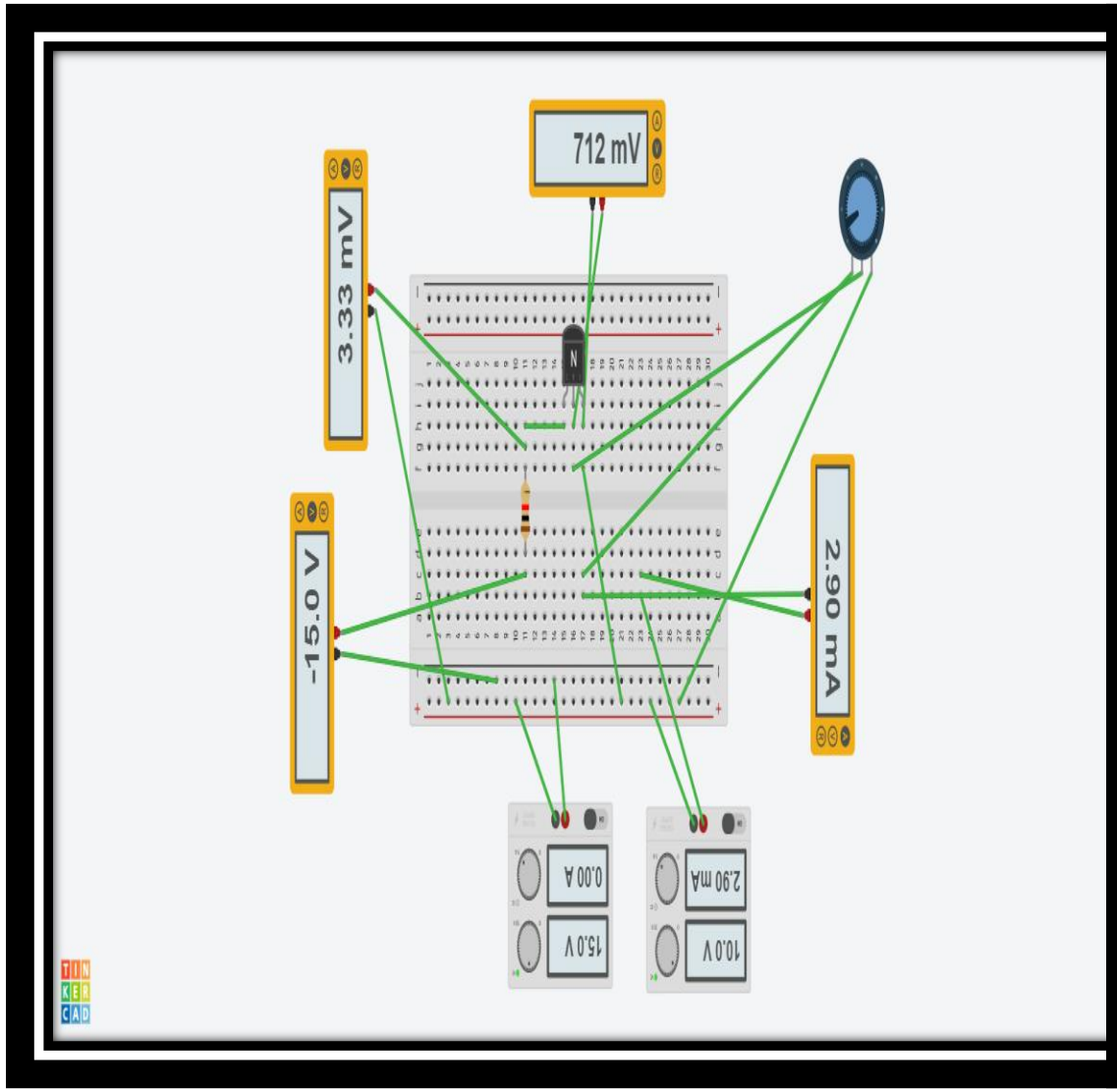

4.50 A
9V

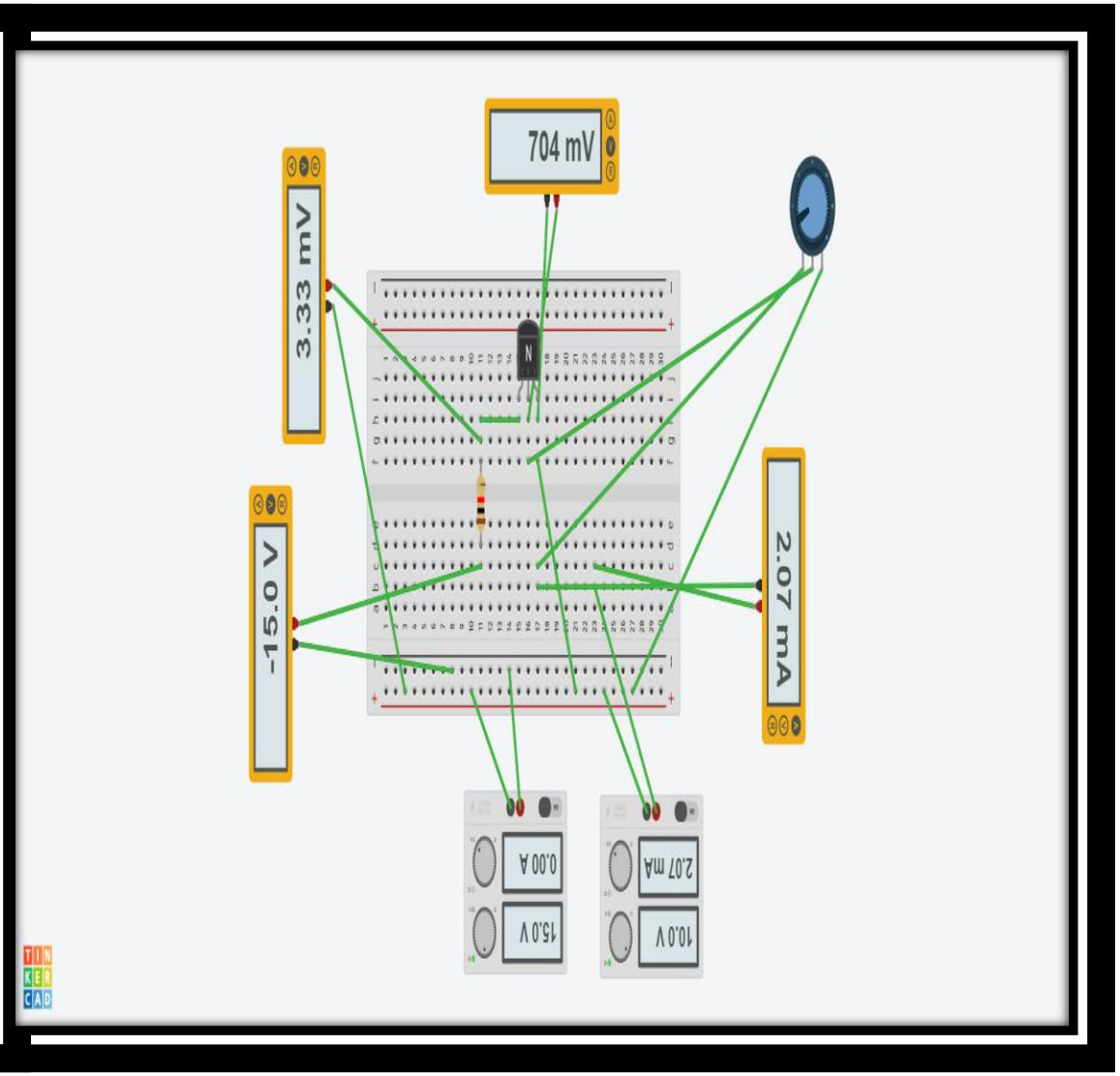
9V
58.1 µA

9V
36.0 µA

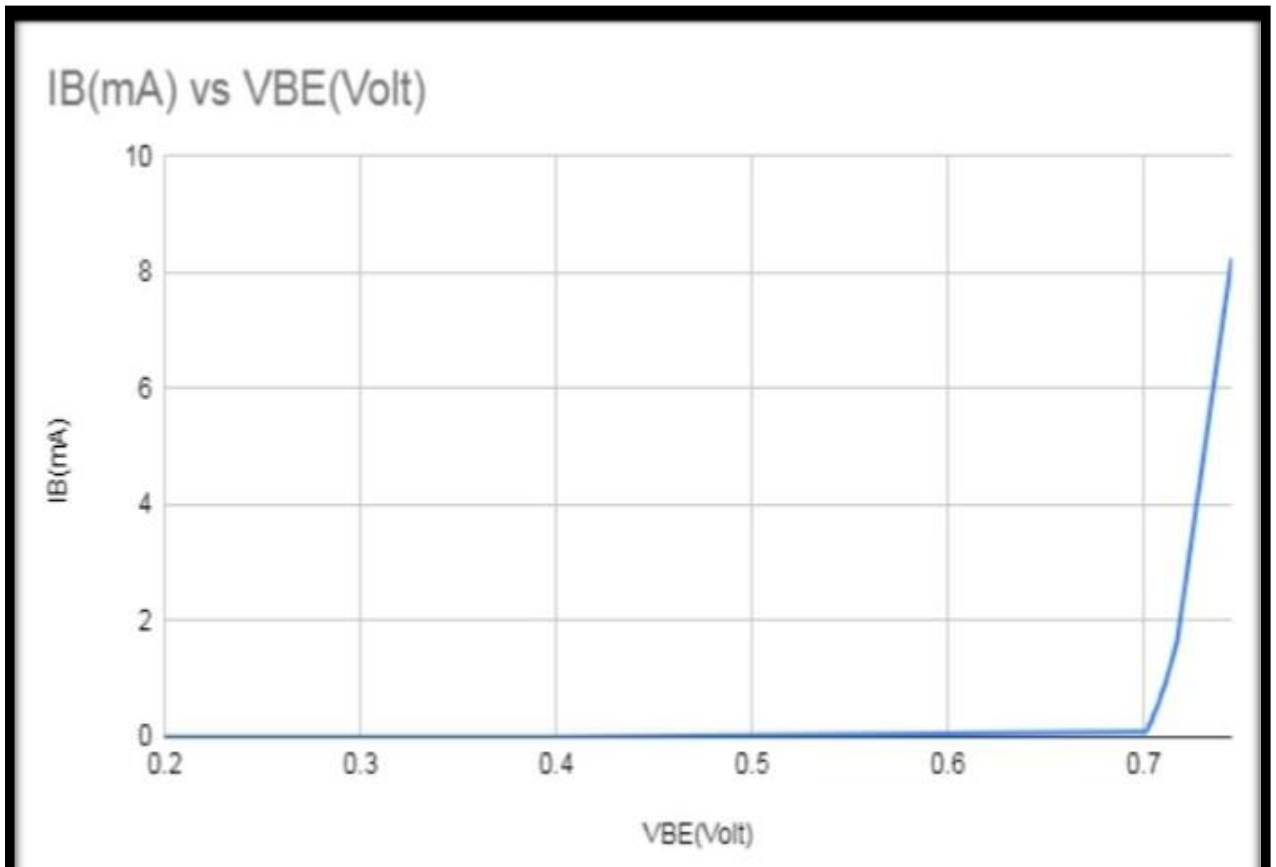
Task 4: Using potentiometer, complete the task 1. Potentiometer in place of Base resistor, terminal 1
with VBB, terminal 2 with transistor and terminal 3 with ground. Maximum value of potentiometer
56Kohm.



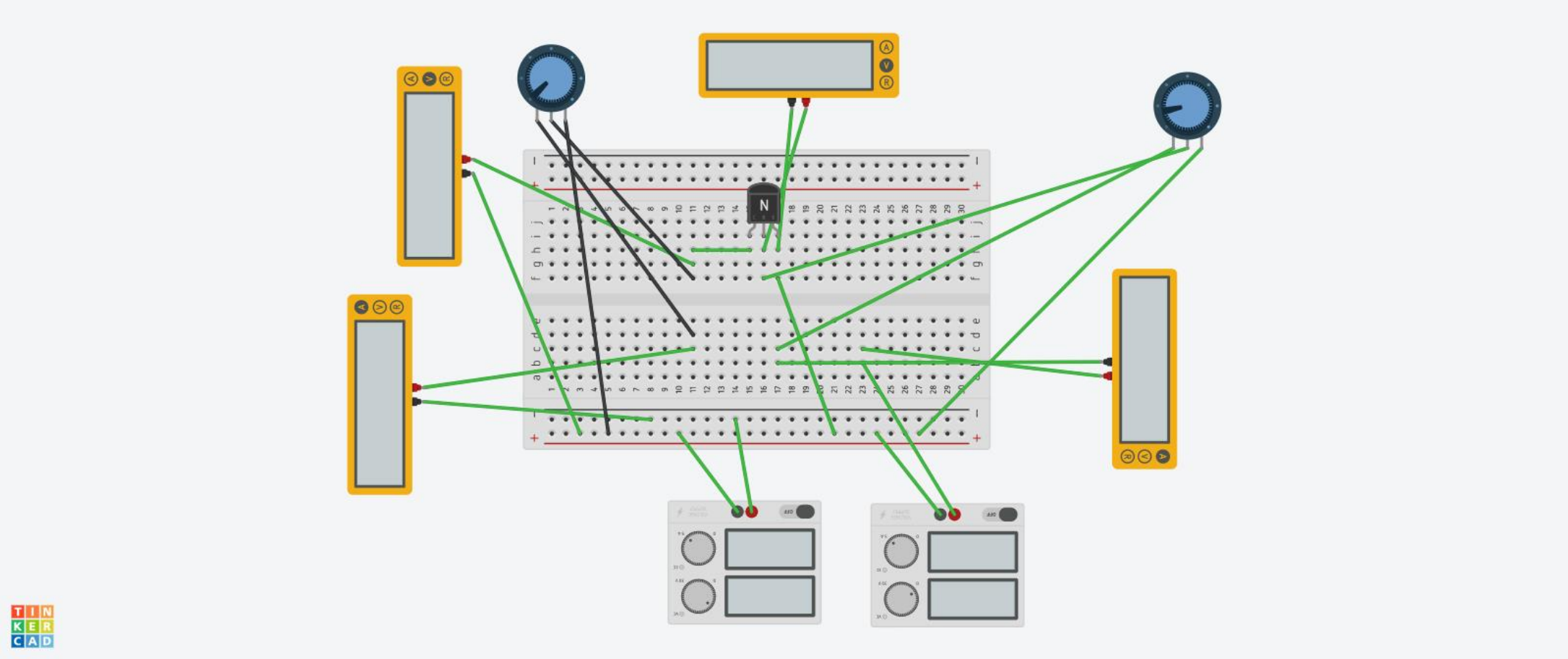

712 mV
3.33 mV
-15.0 V
2.90 mA
0.00 A
15.0 V
2.90 mA
10.0 V


704 mV
3.33 mV
-15.0 V
2.07 mA
0.00 A
15.0 V
2.07 mA
10.0 V

V	VBE(Volt)	IB(mA)
10	0.2	0
10	0.4	0
10	0.701	0.0843
10	0.702	0.119
10	0.703	0.225
10	0.704	0.268
10	0.705	0.373
10	0.708	0.621
10	0.709	0.738
10	0.711	0.906
10	0.717	1.64
10	0.745	8.25



Task 5: Consider the following configuration of the BJT and find the collector curve. Consider IB approximately 100µA,500µA, 1mA. To vary the base current and collector emitter voltage use the potentiometer. Keep the range of VCE form 100mV to 8V. Identify the saturation region, cutoff region and active region. Value of potentiometer at the base is 100K ohm and at collector 100ohm. Make the table as shown below.



IB=1 mA		IB=500 uA		IB=100 uA	
VCE(Volt)	IC(mA)	VCE(Volt)	IC(mA)	VCE(Volt)	IC(mA)
0.043	89.2	0.037	89.2	0.0432	89.2
1.21	291	1.06	193	1.21	94.4
2.1	301	2.17	210	2.1	97.9
3.08	312	3.15	221	3.08	101
4.13	323	4.25	232	4.13	105
5.27	334	5.06	239	5.27	108
6.07	339	6.38	249	6.07	110
7.42	350	7.33	256	7.13	113
8.11	355	8.34	263	8.02	116