

JAYVEE MAPOTE

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Activity #6a: Transistor Biasing

ECE101-1L – FUNDAMENTALS OF ELECTRONIC CIRCUITS (LAB)

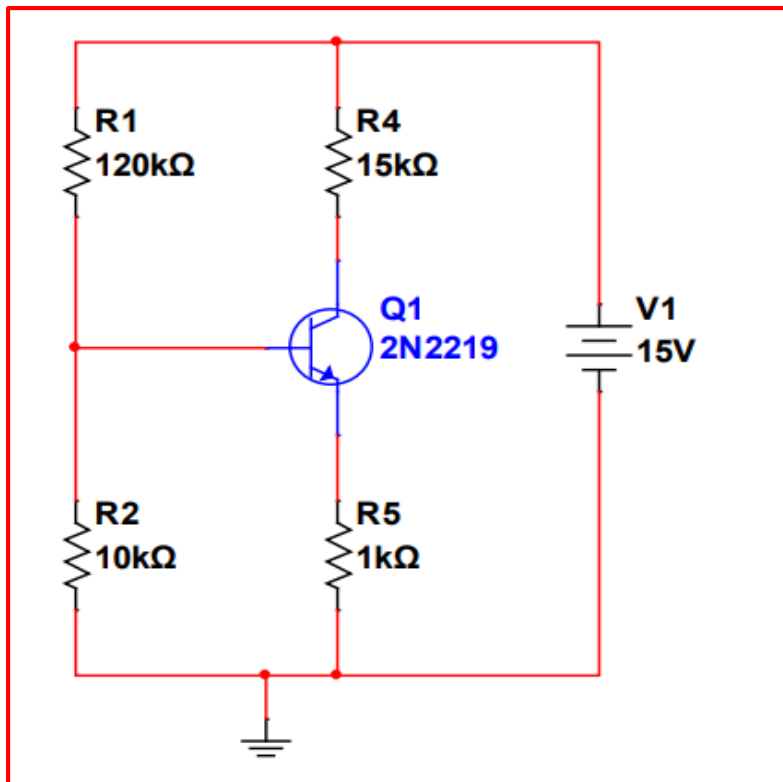
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Procedures:

1. Identify three different transistor circuit configurations

Common Emitter, Common Base, Common Collector

2. Base from your answer on Question #1. Include one screenshot schematic diagrams of each transistor configuration.
3. Open Multisim
4. Create the schematic diagram shown below



5. Calculate and record the Base Voltage (V_B) for Q1

$$V_B = V_A \left(\frac{R2}{R1 + R2} \right)$$

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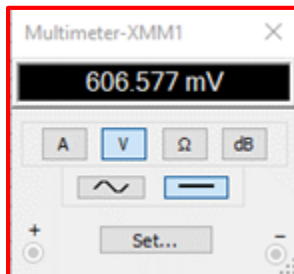
$$15V \left(\frac{10k\Omega}{120k\Omega + 10k\Omega} \right)$$

$$= \mathbf{1.153846 \text{ V}}$$

6. Measure the V_B using Multimeter (+)-probe to the base of transistor and (-)-probe at GND



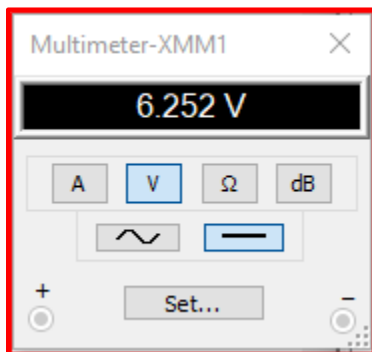
7. Measure the V_{BE} using Multimeter (+)-probe to the base of transistor and (-)-probe at Emitter of the Transistor



8. Is the transistor forward biased?

Yes, it is Forward biased.

9. Measure the V_{CB} using Multimeter (+)-probe to the collector of transistor and (-)-probe at base of the Transistor



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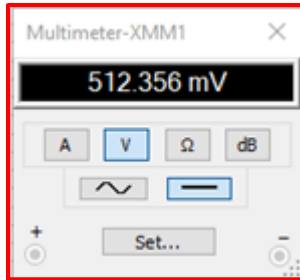
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10. Is the transistor reversed biased?

No, it is not reversed biased

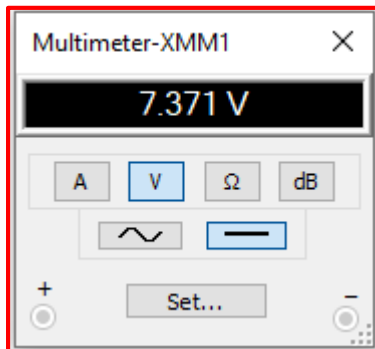
11. Measure the Voltage Across R5 (VE)



12. Calculate the Current (IE) using formula ($I_E = V_E/R_5$)

$$\begin{aligned} I_E &= \frac{V_E}{R_5} \\ &= \frac{512.356mV}{1k\Omega} \\ &= \mathbf{512.356\text{ }mA} \end{aligned}$$

13. Measure the VC using Multimeter (+)-probe to the collector of transistor and (-)-probe at GND.



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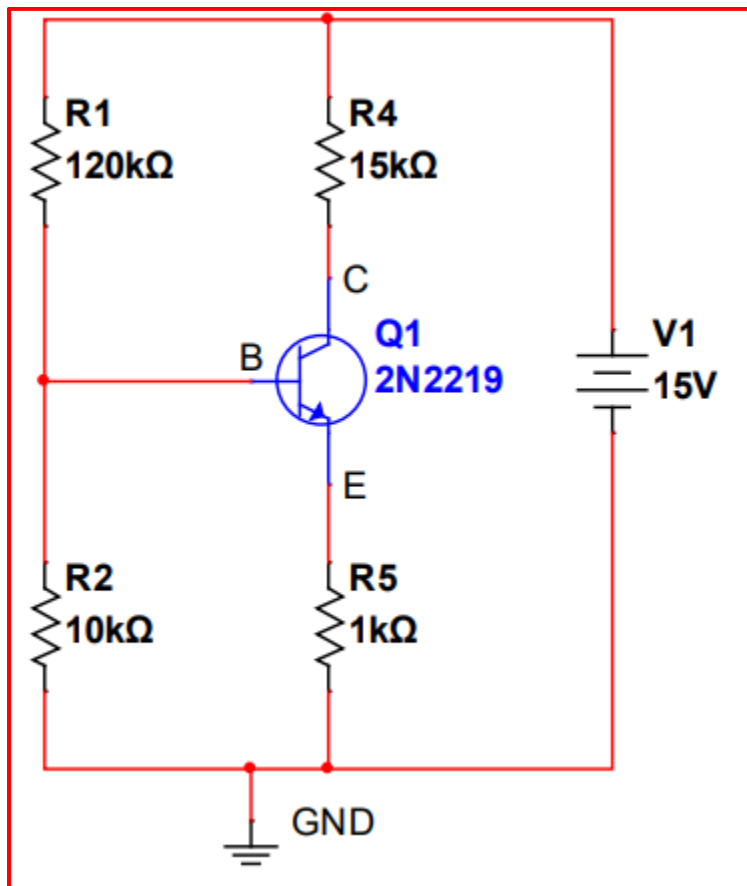
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14. Using TinkerCAD create the schematic shown below Replace 2N2219 with NPN Transistor, for 15V use Power supply and set to 15V



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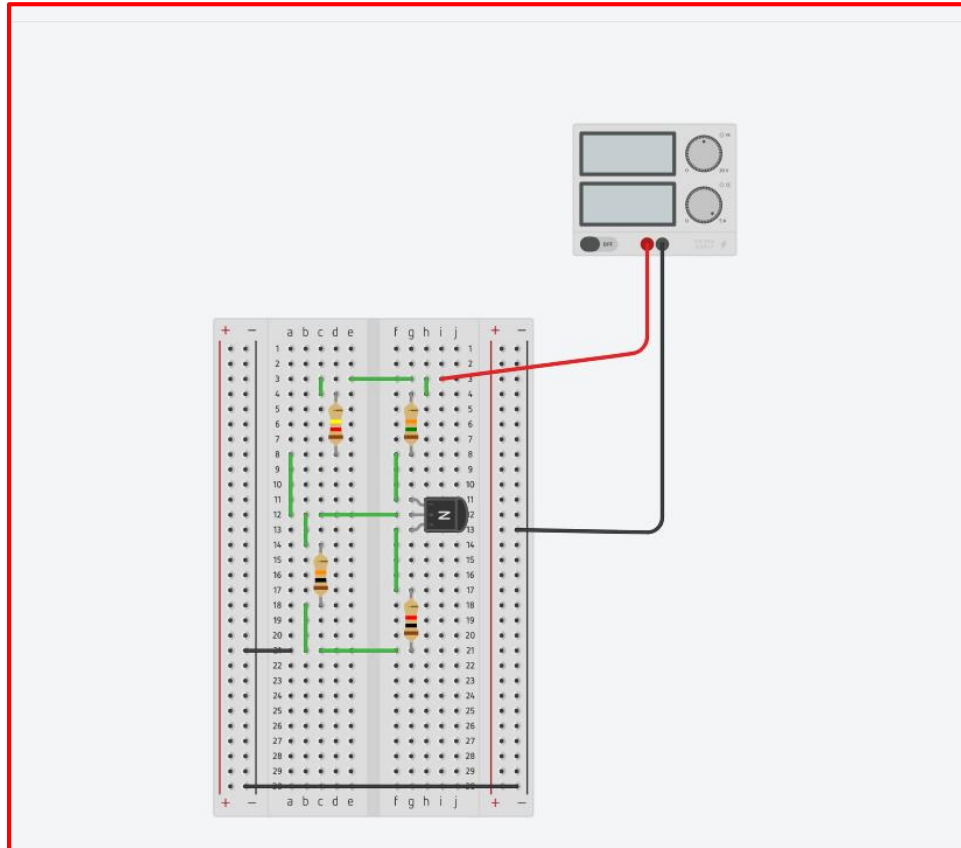
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15. Screenshot your tinkercad work

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