JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

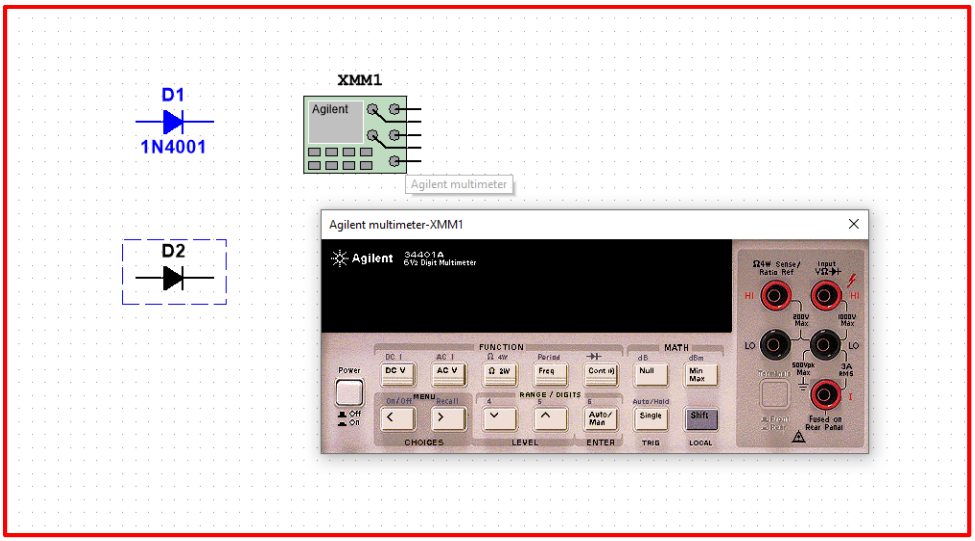
12/01/2021

ECE101-1L – BASIC ELECTRONICS

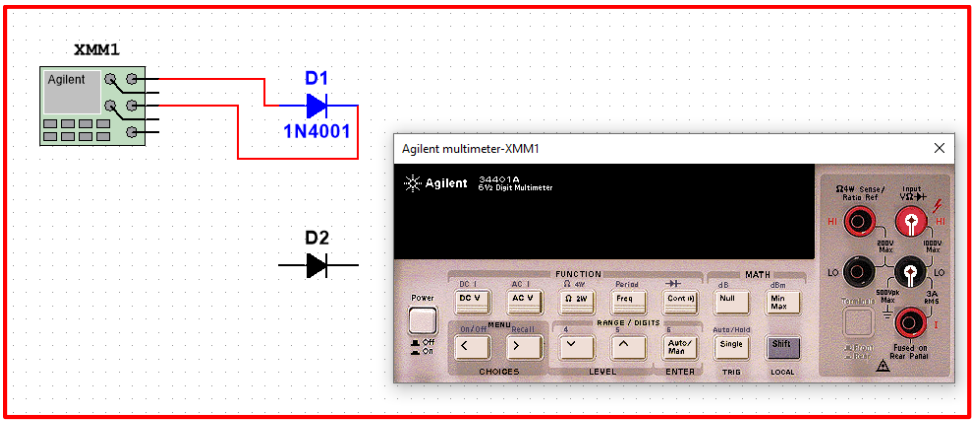
Activity #1b: Diode Test and Familiarization

Part A. Multisim

1. Open Multisim
2. Place a component in your workspace
3. Workspace should be like this:



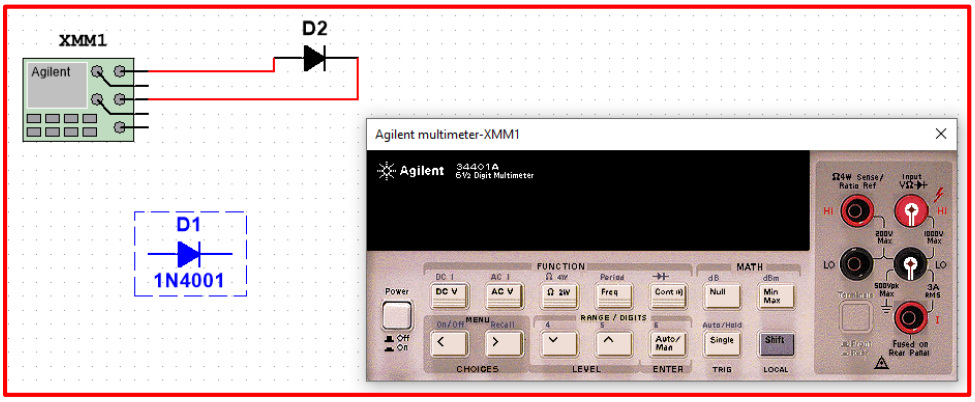
4. Probe/Connect the Red Terminal (HI) (V Ω Diode) Symbol to the Anode terminal of the Diode (1N4001) and the Black Terminal (LO) (Below the Red you used) to the Cathode Terminal of the Diode.
    a. Screenshot your Connection



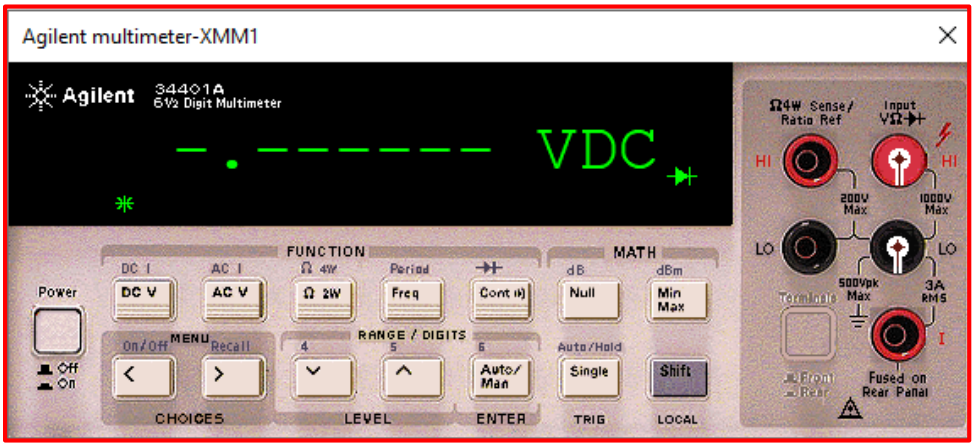
JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

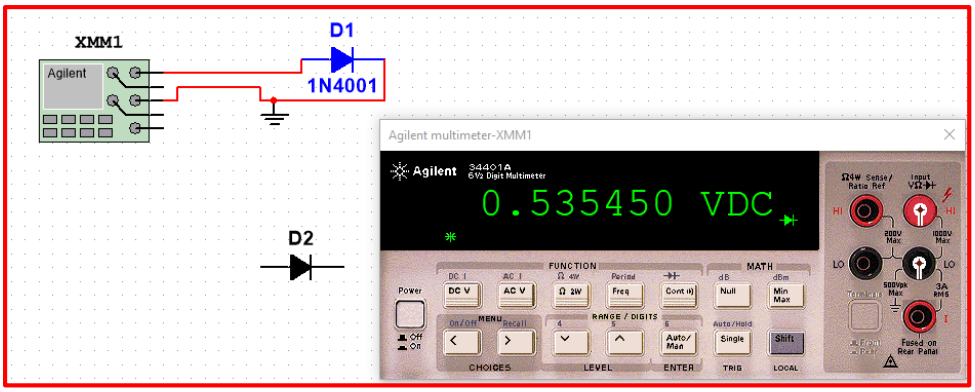
12/01/2021



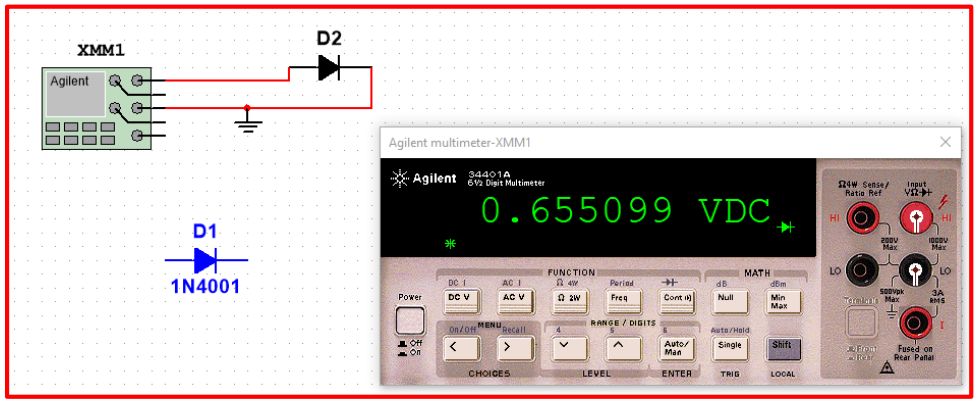
5. Turn on the Agilent Power on and Press Shift->Cont. This will activate the Multimeter function to Diode Test Function. Your LCD display should look like this



6. Run the Simulation (F5) or click the Green Play Button
    a. Screenshot the Voltage Reading

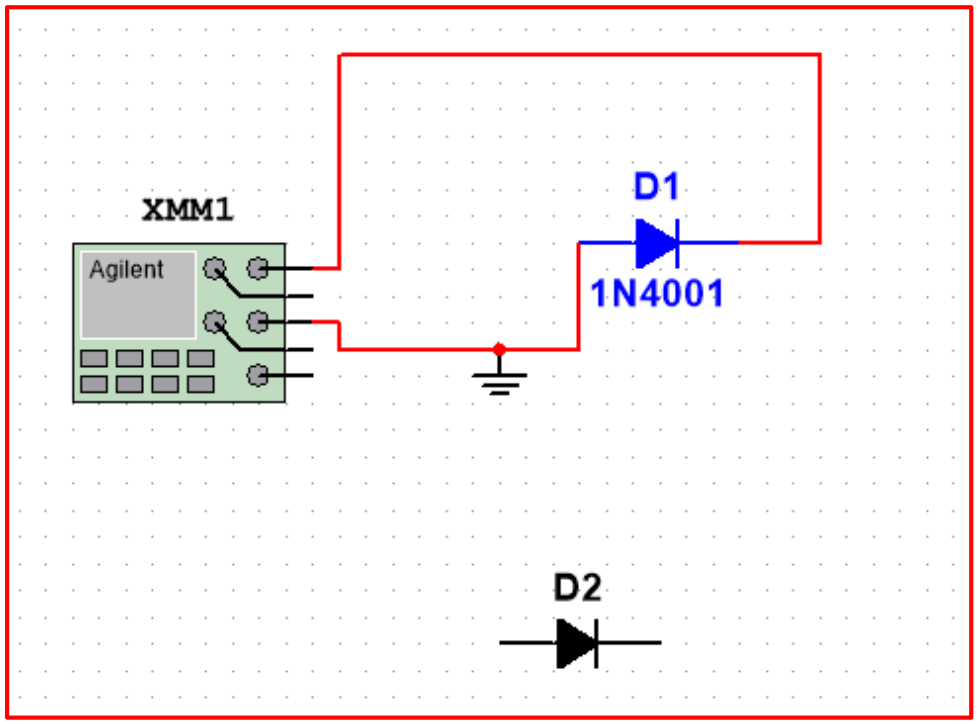


JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR



b. What Conduction state does the meter reading indicate? (Forward Bias or Reverse Bias)
Both diodes are in forward bias.

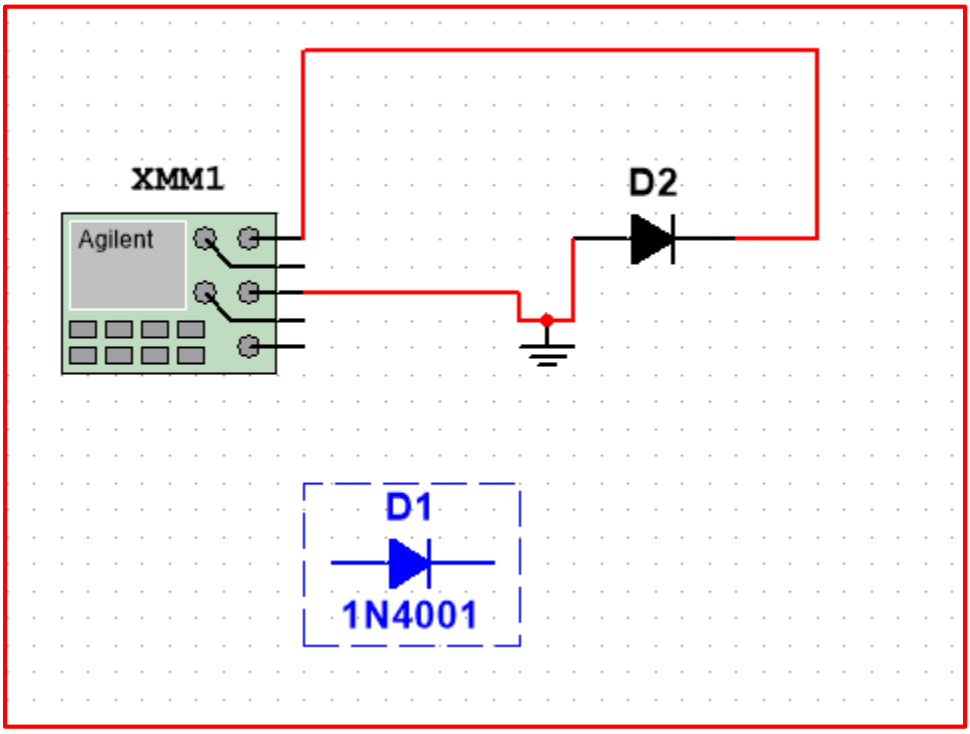
7. Swap the Red and Black Terminals by connecting the Red Terminal to the Cathode and the Black terminal to the Anode of the Diode. Run the Simulation
   a. Screenshot the diagram



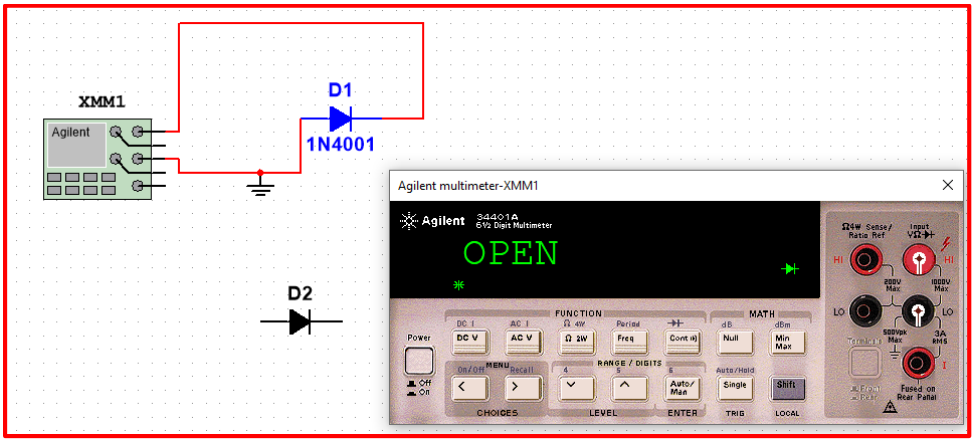
JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021



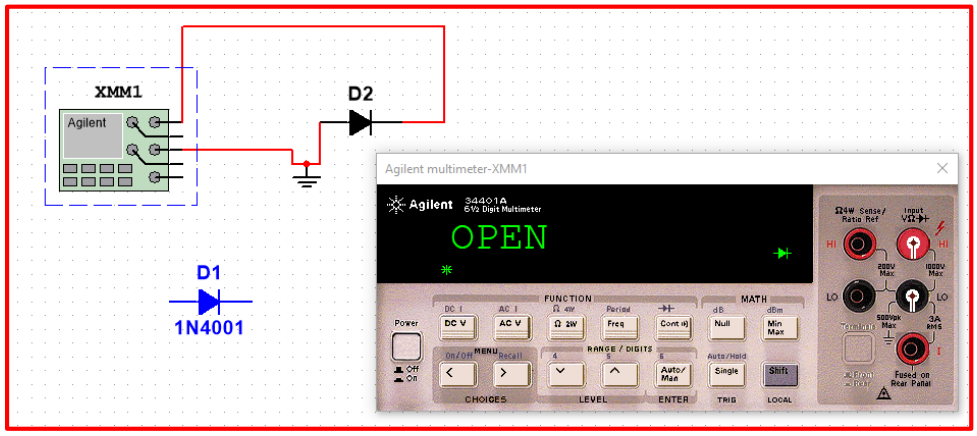
b. Screenshot the Voltage Reading



JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

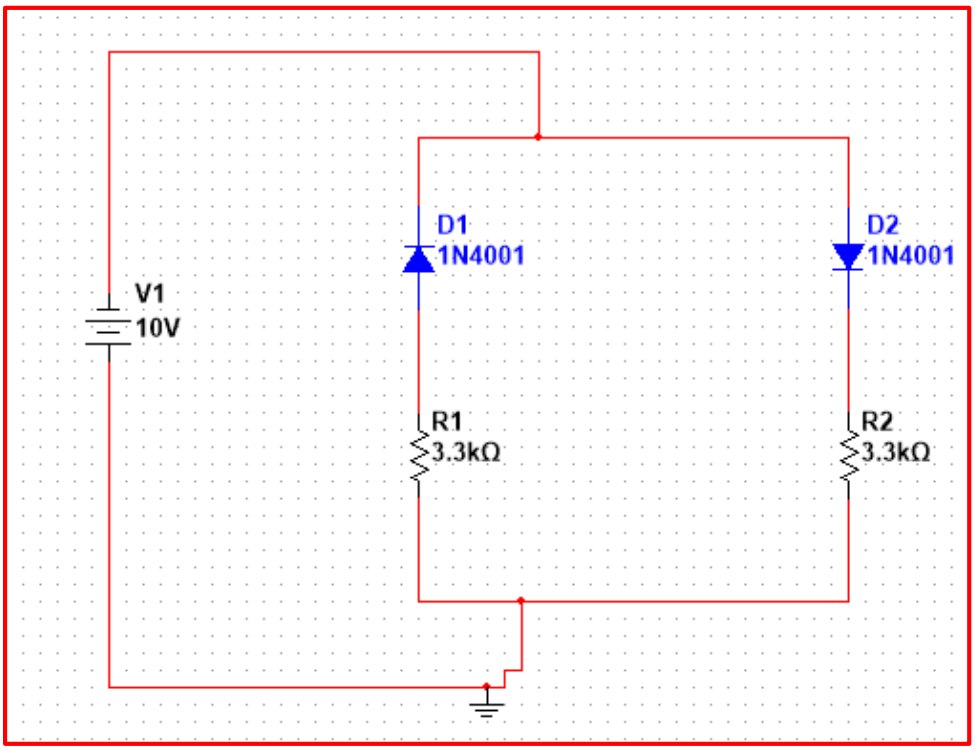
Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021



c. What Conduction state does the meter reading indicate? (Forward Bias or Reverse Bias)
It was an open circuit; both of the diodes are in reverse bias.

8. Create the Schematic diagram shown below

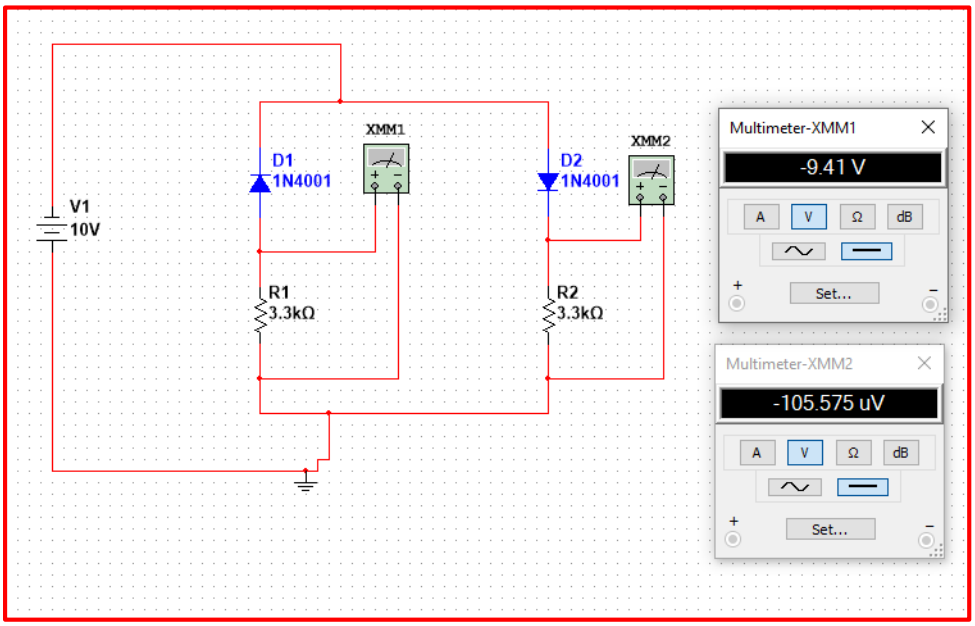


JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

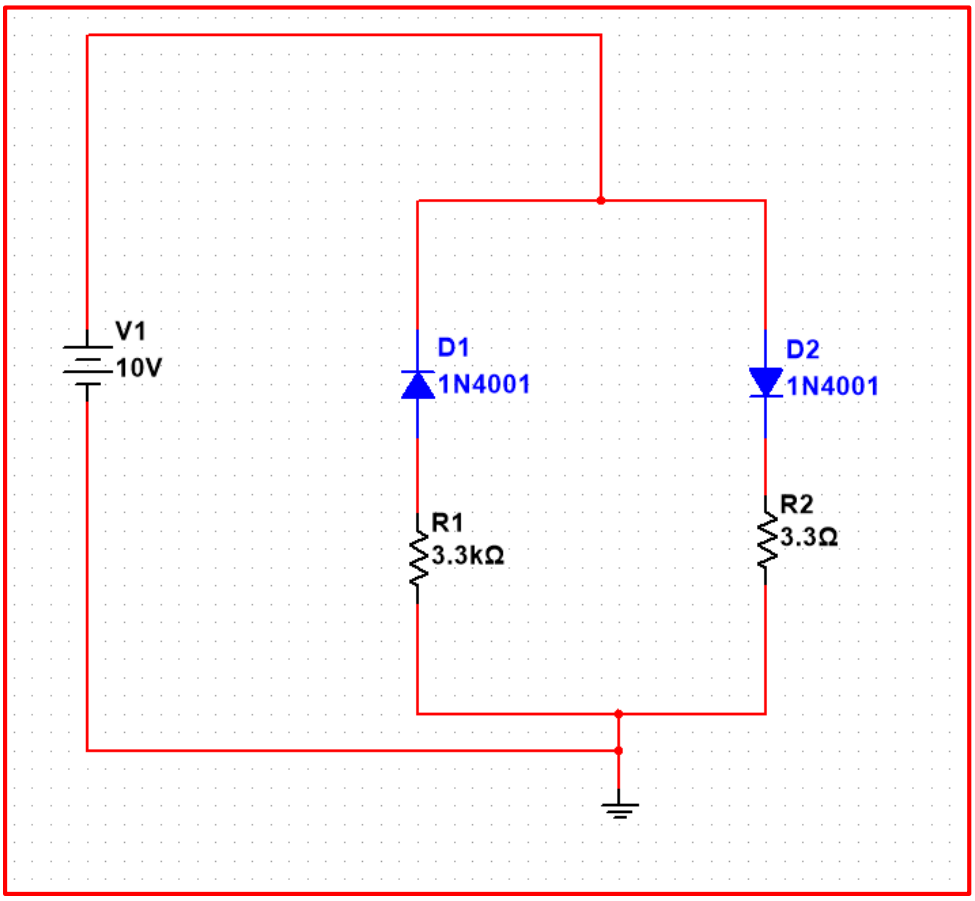
9. Measure the Voltage across R1 and R2, Screenshot the Voltage Reading across



a. R1=-9.41V
b. R2=-105.575uV
c. Identify Which diode is forward biased? D2
d. Identify Which diode is reverse biased? D1

JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

10. Flip the Voltage Supply similar to the schematic diagram below

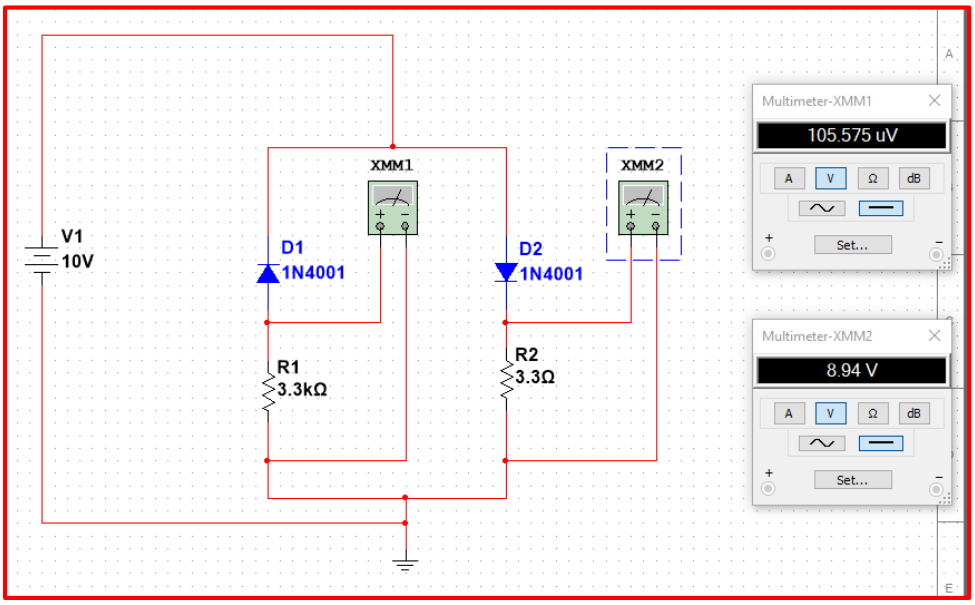


JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

11. Measure the Voltage across R1 and R2, Screenshot the Voltage Reading across



a. R1 = 105.575 uV
b. R2 = 8.94 V
c. Identify Which diode is forward biased?
   D2
d. Identify Which diode is reverse biased?
   D1

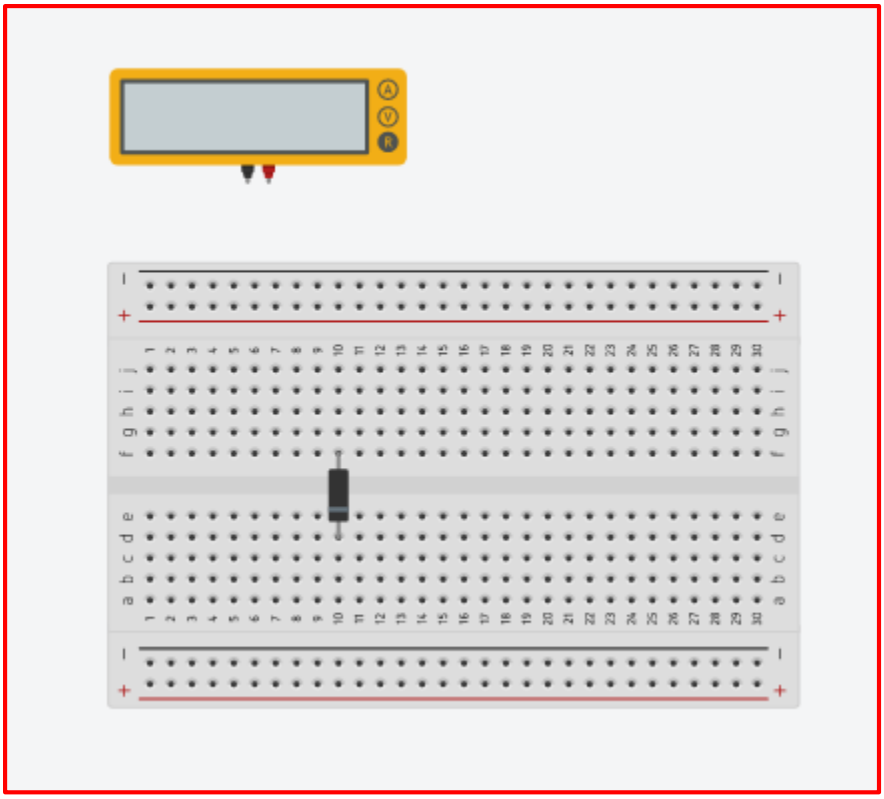
JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

Part B. TInkerCAD

1. Open TinkerCAD and Create a New Circuit
2. Place a Breadboard, Diode and Multimeter

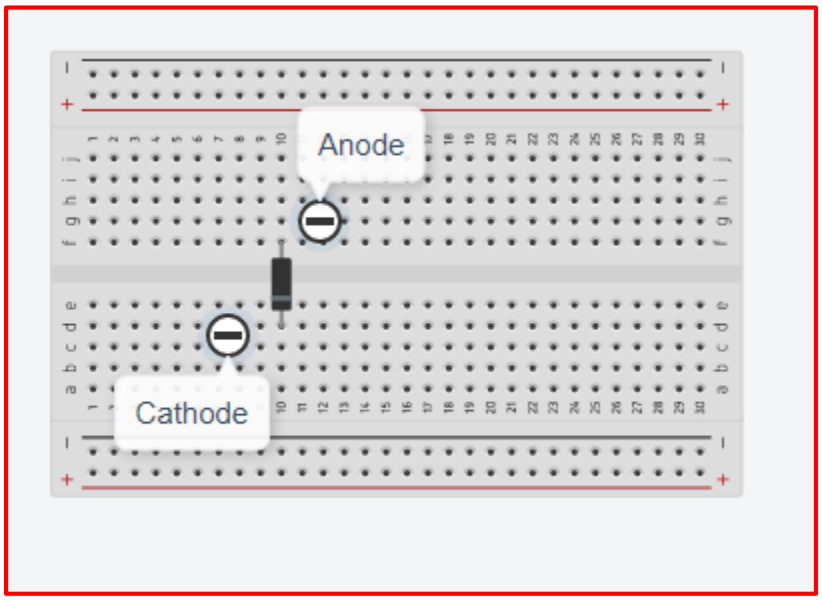


JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

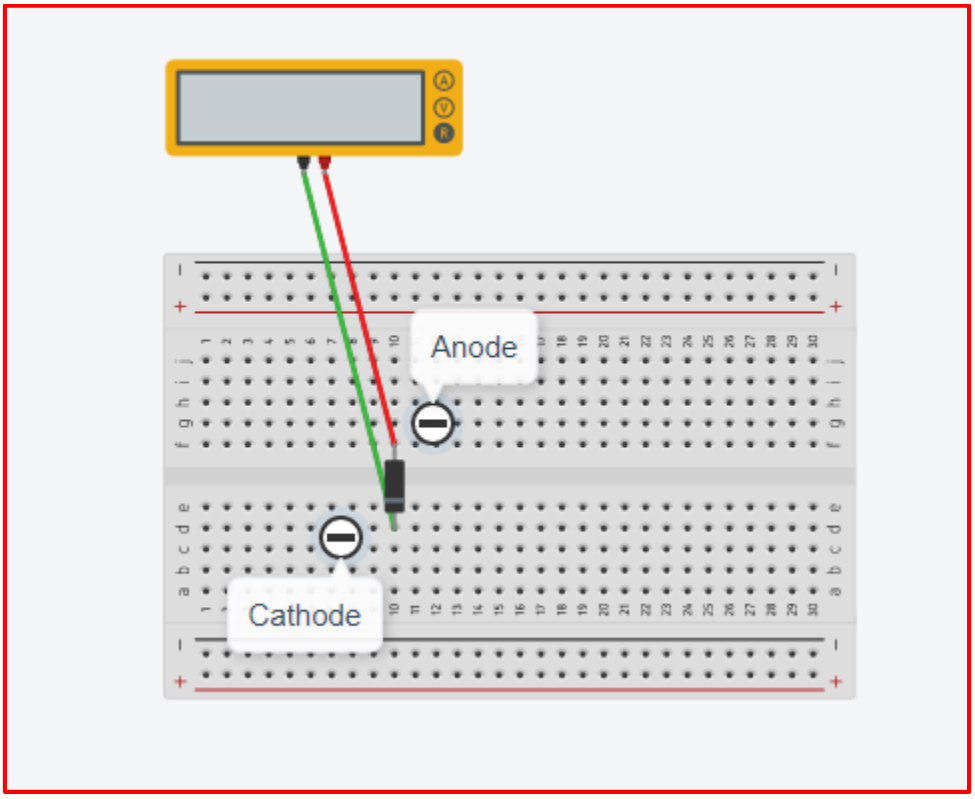
Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

3. Identify which is the Cathode and Anode of the Diode

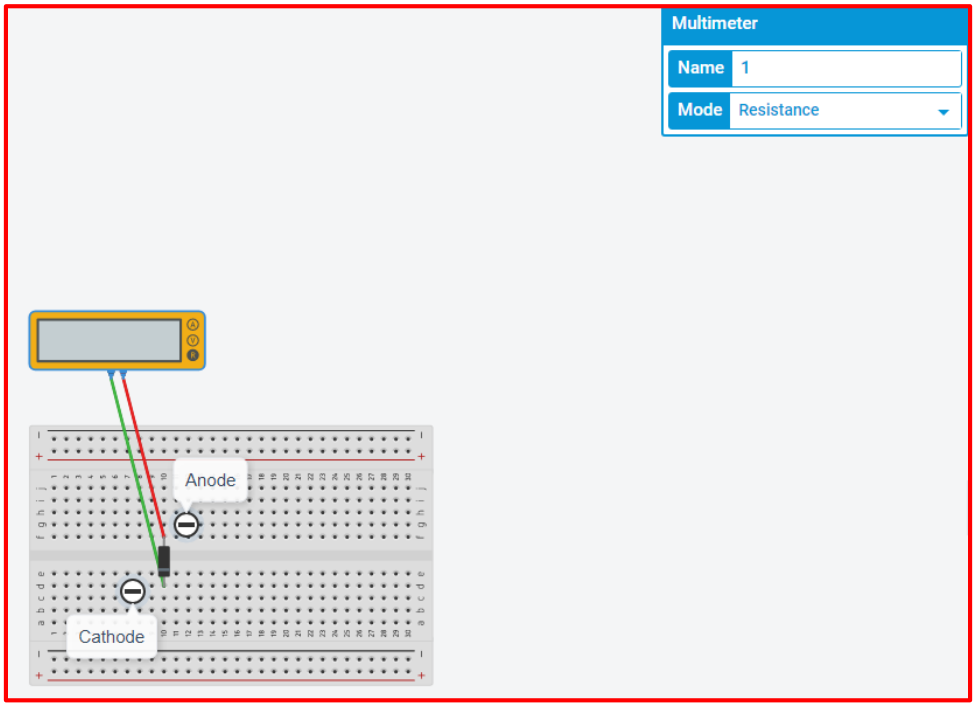


4. Connect the Red Terminal to the Anode and the Black terminal to the Cathode of the diode



JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

5. Run the simulation (make sure the Multimeter is in ® or Resistance Function
    a. Screenshot the schematic

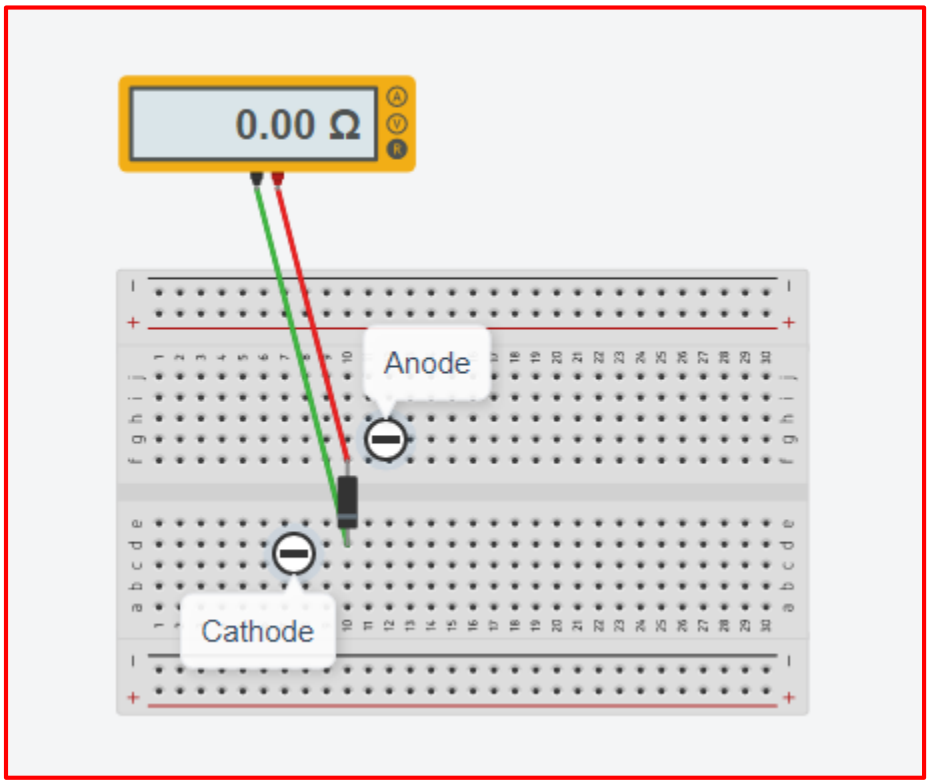


JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

b. Screenshot the Multimeter Readings



c. Base on the reading of multimeter is the diode forward or reverse biased?

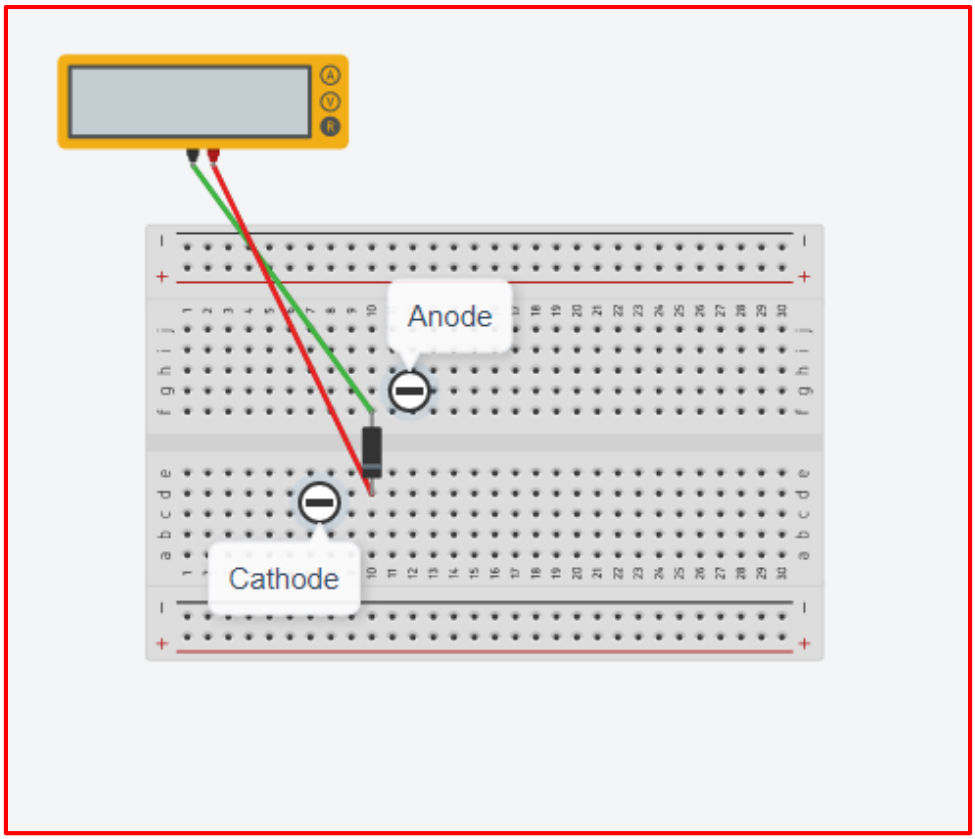
– **Since it has 0 resistance, the diode is forward biased**

JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

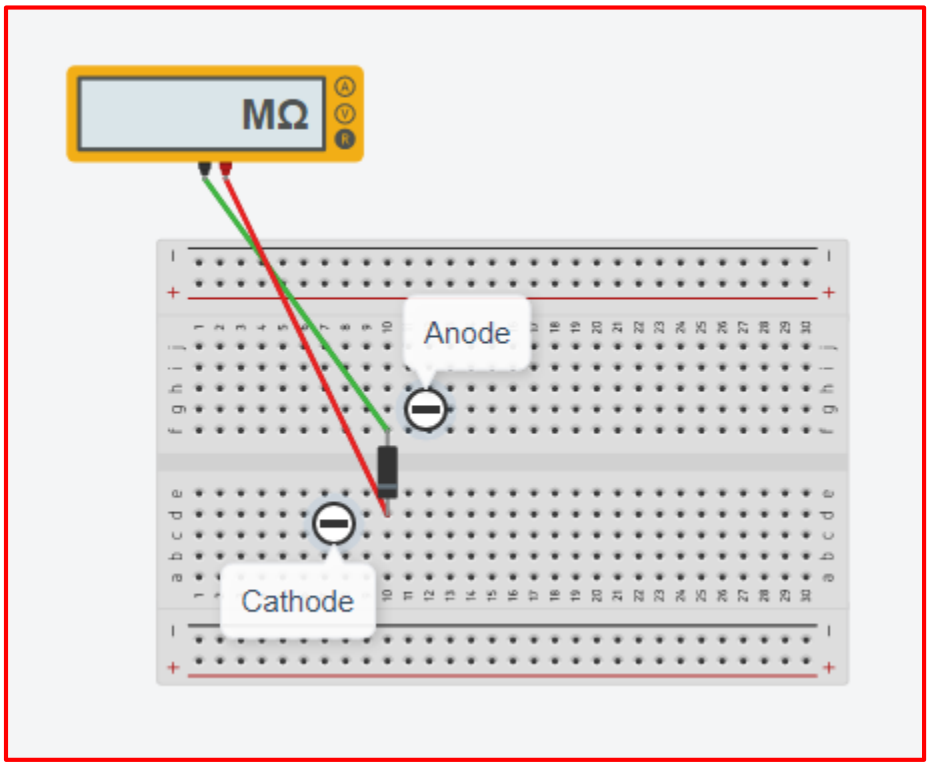
12/01/2021

6. Connect the Black Terminal to the Anode and the Red terminal to the Cathode of the diode
7. Run the simulation (make sure the Multimeter is in ® or Resistance Function
    a. Screenshot the schematic



JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

b. Screenshot the Multimeter Readings



c. Base on the reading of multimeter is the diode forward or reverse biased?

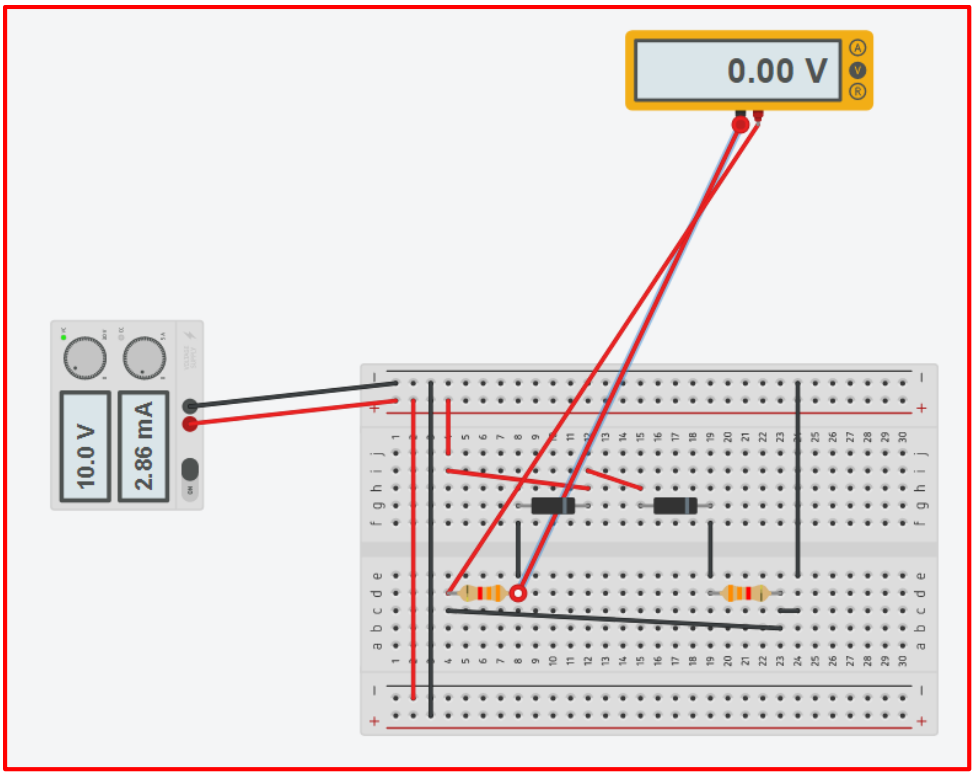
– **Since it shows infinite resistance based on the reading, the diode is reverse biased**

JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

8. Using TinkerCAD Create the Schematic diagram shown below
9. Measure the Voltage across R1 and R2, Screenshot the Voltage Reading across
    a. **R1 = 0**

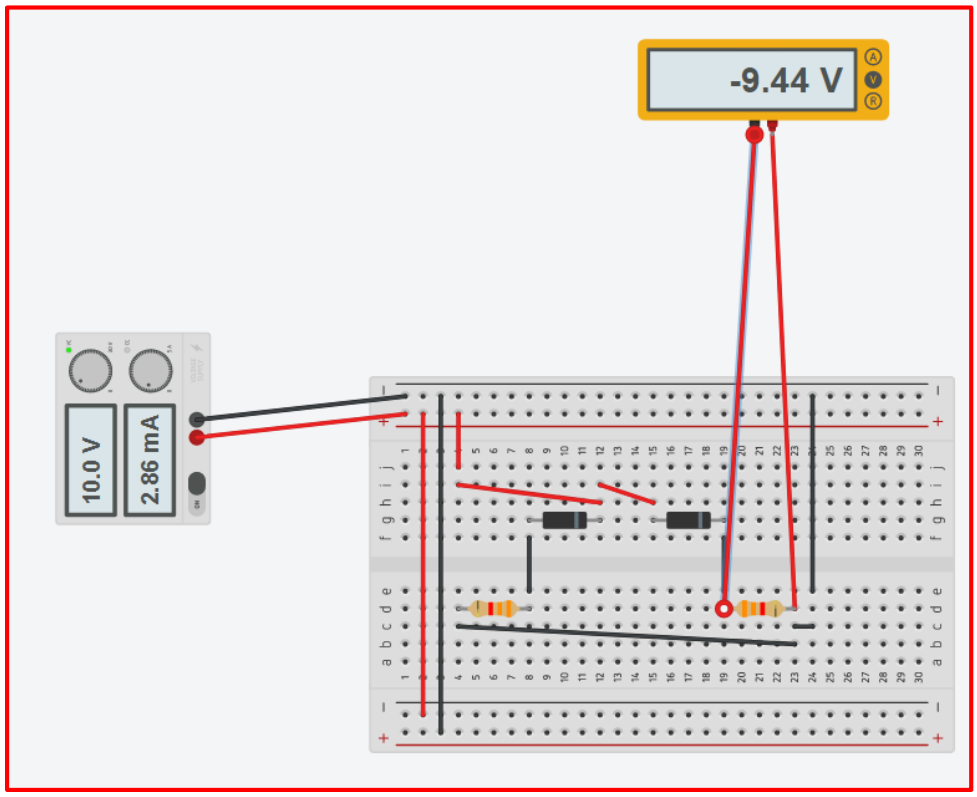


JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

b. **R2 = -9.44v**



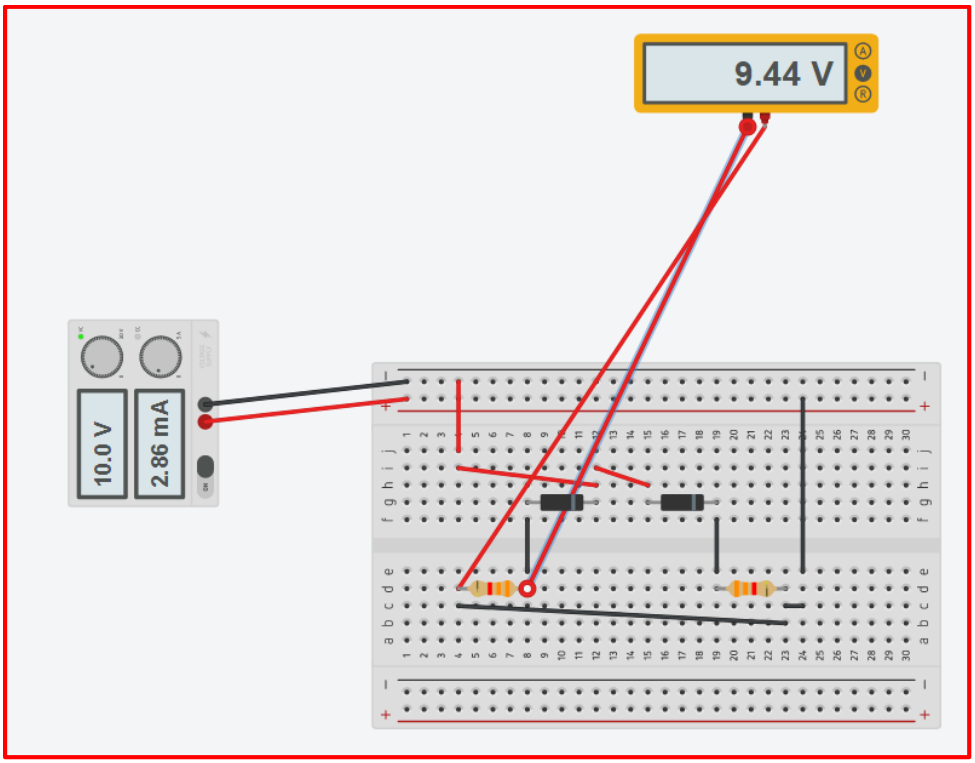
c. Identify Which diode is forward biased? **D1**
d. Identify Which diode is reverse biased? **D2**

JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

10. Flip the Voltage Supply similar to the schematic diagram below
11. Measure the Voltage across R1 and R2, Screenshot the Voltage Reading across
    a. **R1 = 9.44V**

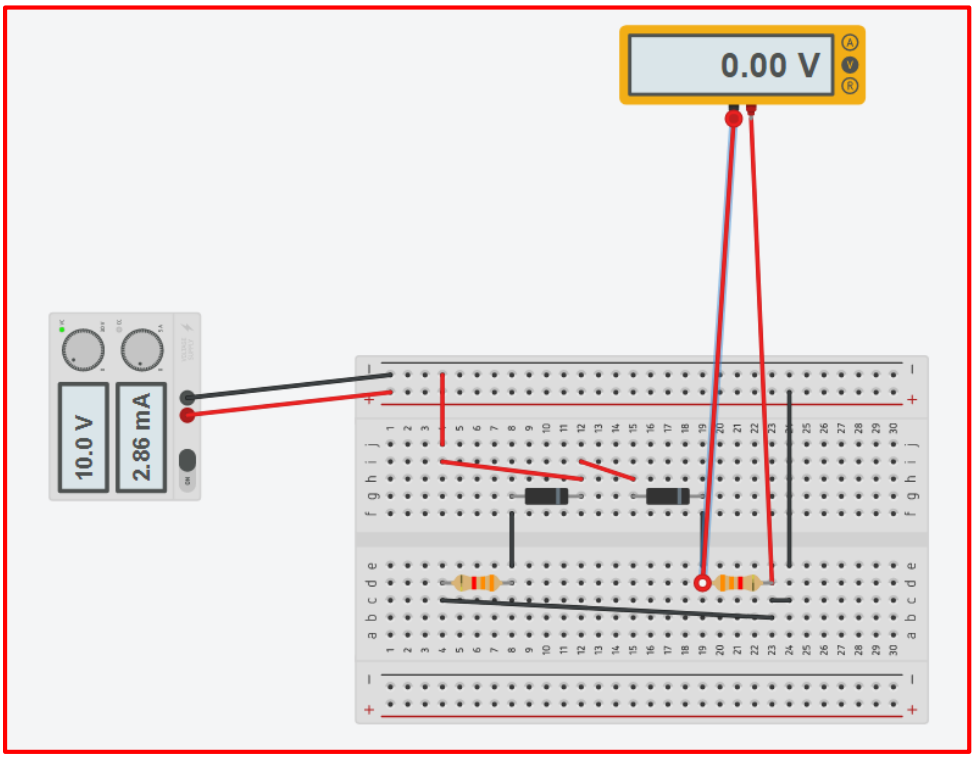


JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

b. **R2 = 0V**



c. Identify Which diode is forward biased? **D1**
d. Identify Which diode is reverse biased? **D2**

JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

Part C. Questions and Problems

1. CD800a Multimeter is shown below, at which selector should be place in order to measure / test a Diode?

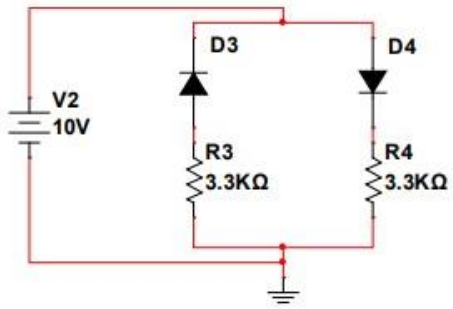
The selector should be placed in resistance mode in order to measure a diode.

JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

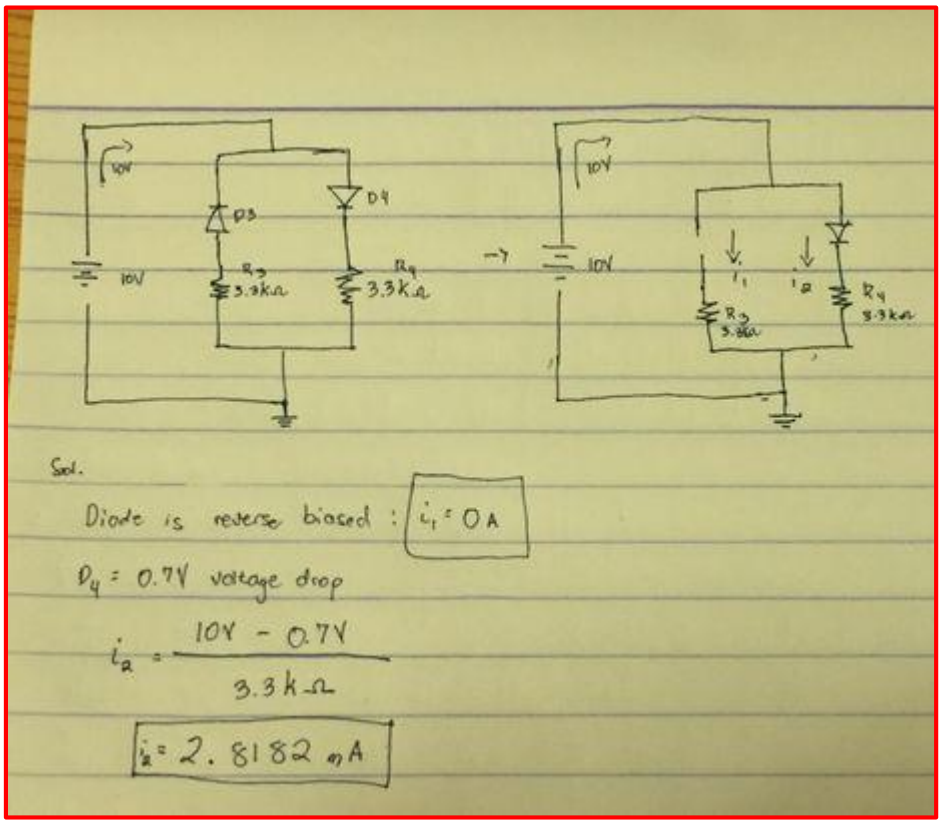
Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

2. Consider the schematic shown below (use DIODE VIRTUAL / IDEAL DIODE)



a. CALCULATE the current flowing through the resistor

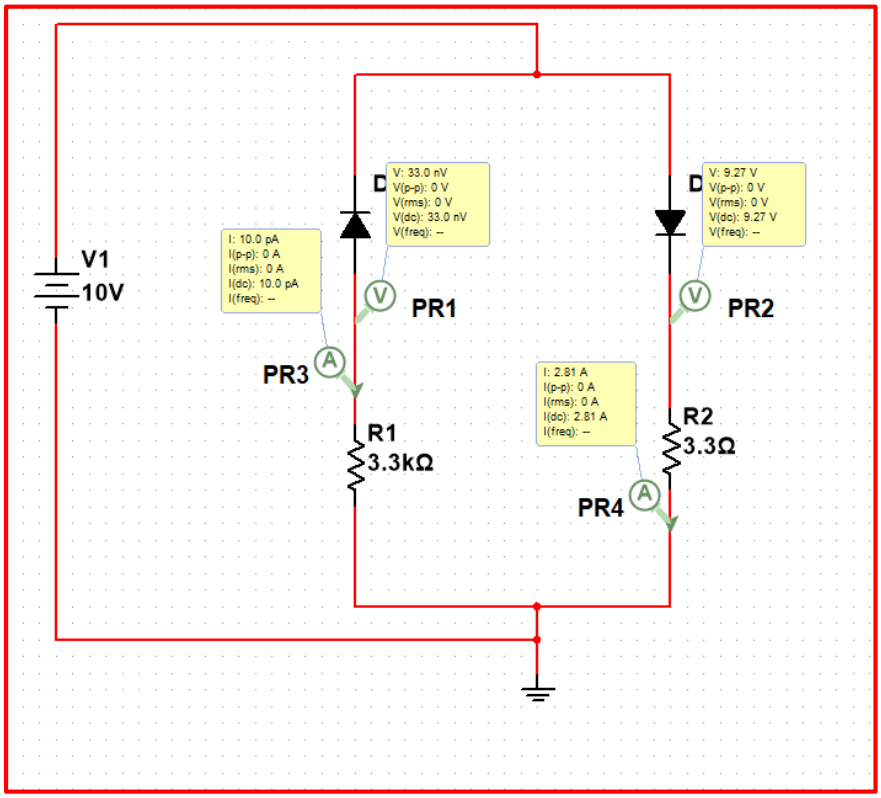


JAYVEE MAPOTE
JEREMY EDWARD COBAR
LIAN YZABELLE MANALO
MARHU ANDRE MAAÑO
ZIAN OLIVER SALVADOR

Laboratory Activity #1b
Diode Test and Familiarization

12/01/2021

b. Verify the results using Multisim



Discussions:

Thanks to Multisim and TinkerCAD, we can now test schematics with diodes and resistors and also use a (virtual) multimeter to test these components to compare data between either program and our manual calculations