

Name _____
AP Physics
Period _____

Date _____
Lab Activity #13 (40 pts)
Mrs. Nadworny

Partners:

Due Date _____

Series & Parallel Circuits

NO Lab Write-Up Required
must be neatly written in pencil

Purpose

- To build and analyze series and parallel circuits qualitatively.

Materials

- 3 batteries
- 3 battery holders
- Connecting Wires
- 3 small light bulbs
- 3 light bulb bases
- Eyes and Brain

SERIES CIRCUITS

Use 3 batteries connected together for the entire lab!

1. Build series circuits with one, two, and then three light bulbs. Draw a schematic in the space below for each circuit. (4 pts)
2. Compare the brightness of the light bulbs to each other in the triple bulb circuit. (1 pt)
3. Compare the brightness of one bulb in the triple bulb circuit to the brightness of the same bulb in the double bulb circuit. (1 pt)
4. Compare the current running through each bulb with the total current coming out of the batteries in the triple bulb circuit. (1 pt)
5. Compare the voltage drop across each bulb with the total voltage supplied by the batteries in the triple bulb circuit. (1 pt)

6. Compare the total current in the triple bulb circuit with the total current in the double bulb circuit. (1 pt)
7. Compare the voltage across one bulb in the triple bulb circuit with the voltage across the same in the double bulb circuit. (1 pt)
8. If the bulbs did not all have identical resistance, would each bulb have the same current running through it in a triple bulb circuit? If not, which would get more? (2 pts)
9. If the bulbs did not all have identical resistance, would each bulb have the same voltage drop across it in a triple bulb circuit? If not, which would get more? (2 pts)
10. If the bulbs did not all have identical resistance, would each bulb be equally bright in a triple bulb circuit? If not, which would be brighter? (2 pts)

PARALLEL CIRCUITS

Use 3 batteries connected together for the entire lab!

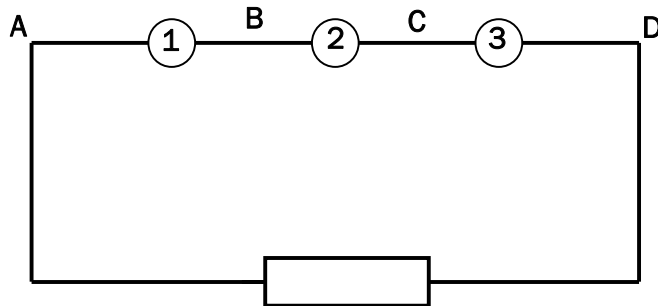
11. Build parallel circuits with one, two, and then three light bulbs. Draw a schematic in the space below for each circuit. (4 pts)
12. Compare the brightness of the light bulbs to each other in the triple bulb circuit. (1 pt)

13. Compare the brightness of one bulb in the triple bulb circuit to the brightness of the same bulb in the double bulb circuit. (1 pt)
14. Compare the current running through each bulb with the total current coming out of the batteries in the triple bulb circuit. (1 pt)
15. Compare the voltage drop across each bulb with the total voltage supplied by the batteries in the triple bulb circuit. (1 pt)
16. Compare the total current in the triple bulb circuit with the total current in the double bulb circuit. (1 pt)
17. Compare the voltage across one bulb in the triple bulb circuit with the voltage across the same bulb in the double bulb circuit. (1 pt)
18. If the bulbs did not all have identical resistance, would each bulb have the same current running through it in a triple bulb circuit? If not, which would get more? (2 pts)
19. If the bulbs did not all have identical resistance, would each bulb have the same voltage drop across it in a triple bulb circuit? If not, which would get more? (2 pts)
20. If the bulbs did not all have identical resistance, would each bulb be equally bright in a triple bulb circuit? If not, which would be brighter? (2 pts)

TEST YOURSELF

Build the following circuit so that all three bulbs are lit. Then, if possible, amend the circuit as described in directions 1 – 6. State between which two letters you would place your wire.

(6 pts)



1. Place a single wire to make 1 and 2 stay on and 3 go out. Where?
2. Place a single wire to make 1 and 3 stay on and 2 go out. Where?
3. Place a single wire to make 2 and 3 stay on and 1 go out. Where?
4. Place a single wire to make 1 stay on and 2 and 3 go out. Where?
5. Place a single wire to make 2 stay on and 1 and 3 go out. Where?
6. Place a single wire to make 3 stay on and 1 and 2 go out. Where?