

# Parallel/Series Lab Pre-assessment

Name: \_\_\_\_\_

1. Please draw 2 batteries in series.
2. Please draw 2 batteries in parallel.
3. Please draw 2 light bulbs in series.
4. Please draw 2 light bulbs in parallel.
5. Will the voltage of 2 batteries be greater when in series or in parallel? Why?
6. Assume each battery is 6v. What would the measured voltage be in series and in parallel?  
Series voltage:  
Parallel voltage:
7. Would light bulbs connected in series or parallel be brighter?
8. Will the current of 2 batteries be greater in series or in parallel? Why?
9. Assume each battery can provide 2A (amps) of current to a light bulb circuit. What would the measured current be in series and in parallel?  
Series voltage:  
Parallel voltage:
10. Do electrons flow from positive to negative or negative to positive?

## Parallel/Series Lab

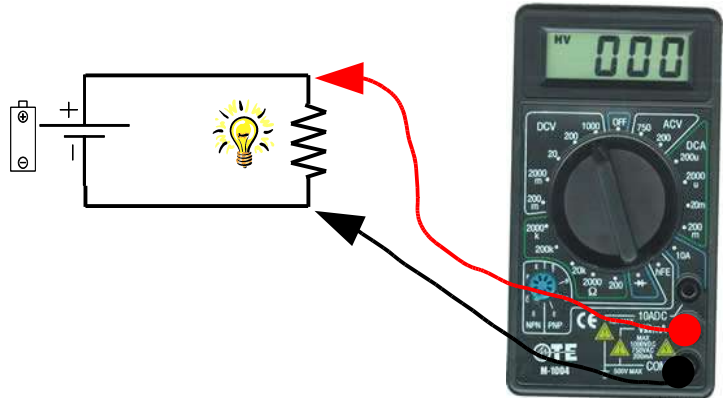
1. Measure the voltage of each battery before connecting to the light bulb. Set the multimeter to 20v on the DCV setting.

Battery 1 voltage:

Battery 2 voltage:

What is the sum of the battery voltages?

2. Connect the battery as shown below and measure the voltage by putting the red probe where the red dot is and the black probe where the black dot is.



What is your measured voltage?

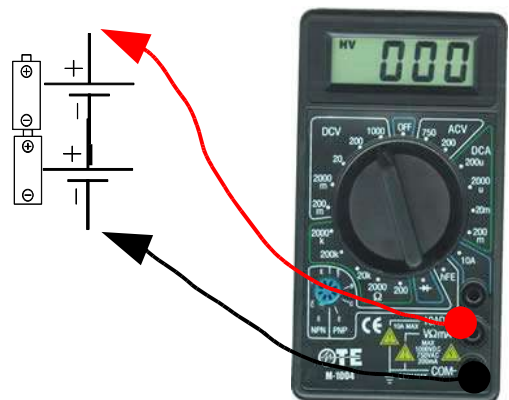
Why is it different from the one above?

Measure the current (meter set to 10A and red probe in 10A hole). When measuring current the meter needs to be part of the circuit so that the electrons flow through the meter. The meter needs to be treated as if it is one of the wires connecting one part of the circuit to the other.

Current:

Explain the reading:

3. Connect 2 batteries in series as shown below and measure the voltage.



What is your measured voltage?

Explain the reading:

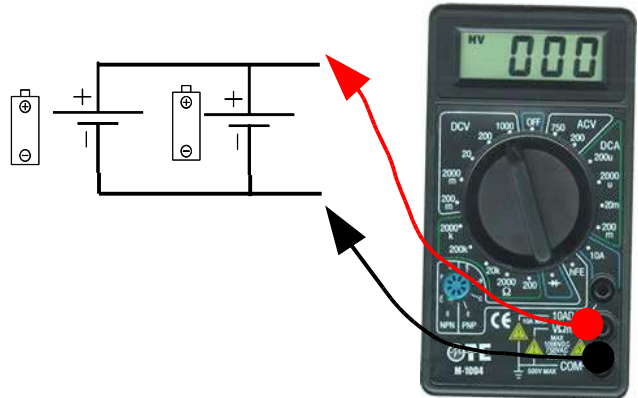
How does this compare with your sum in question 1?

Measure the current and record here:

Explain the reading:

## Parallel/Series Lab

4. Connect the 2 batteries in parallel as shown below and measure the voltage.

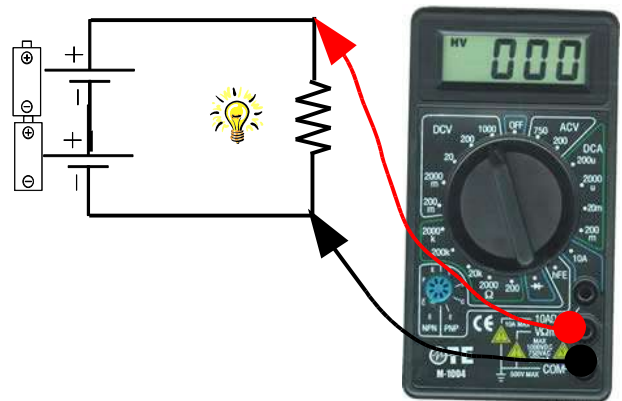


What is your measured voltage?  
 Explain the reading:  
 How does this compare with your sum in question 1?

Explain why this answer is different than that of question 3.

Measure the current and record here:  
 Explain the reading:

5. Connect your circuit as shown.  
 What is the configuration of the batteries (series or parallel)?



What is the voltage?  
 Explain the reading:

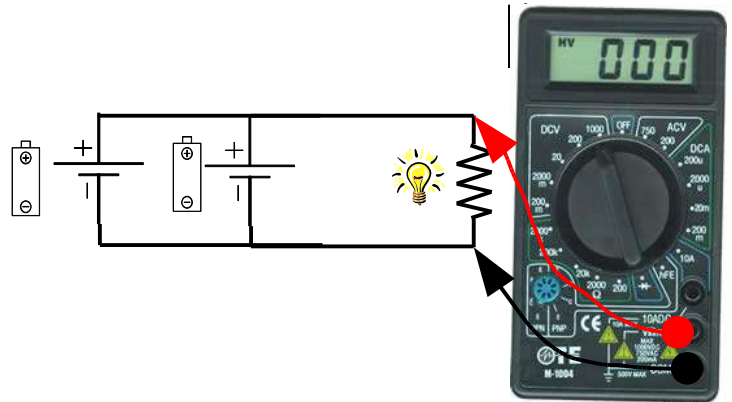
Measure the current and record here:  
 Explain the reading:

How does the voltage compare with the answer for question 3, why?

Connect the circuit as shown in question 2 – Which configuration causes the light bulb to be brighter, why (think hard)?

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6. Connect your circuit as shown.  
What is the configuration of the batteries (series or parallel)?



What is the voltage?  
Explain the reading:

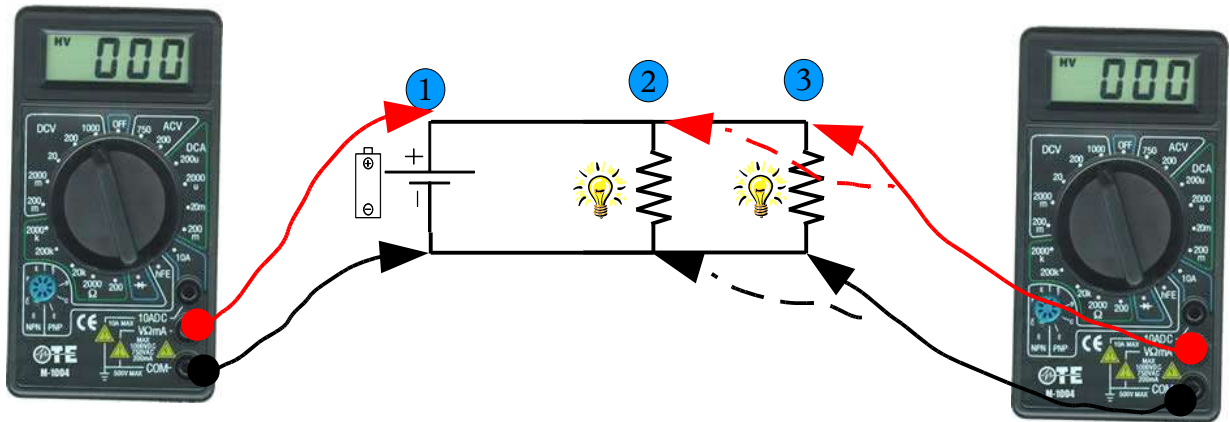
What is the current?  
Explain the reading:

How does the voltage compare with the answer for question 4, why?

How does the current compare with the answer for question 5, why?

Connect the circuit as shown in question 2 and 5 – Which configuration causes the light bulb to be brighter, why (think hard)?

7. Connect your circuit as shown and measure the voltages and currents at positions 1, 2, and 3.



Are the light bulbs in a series or parallel configuration?

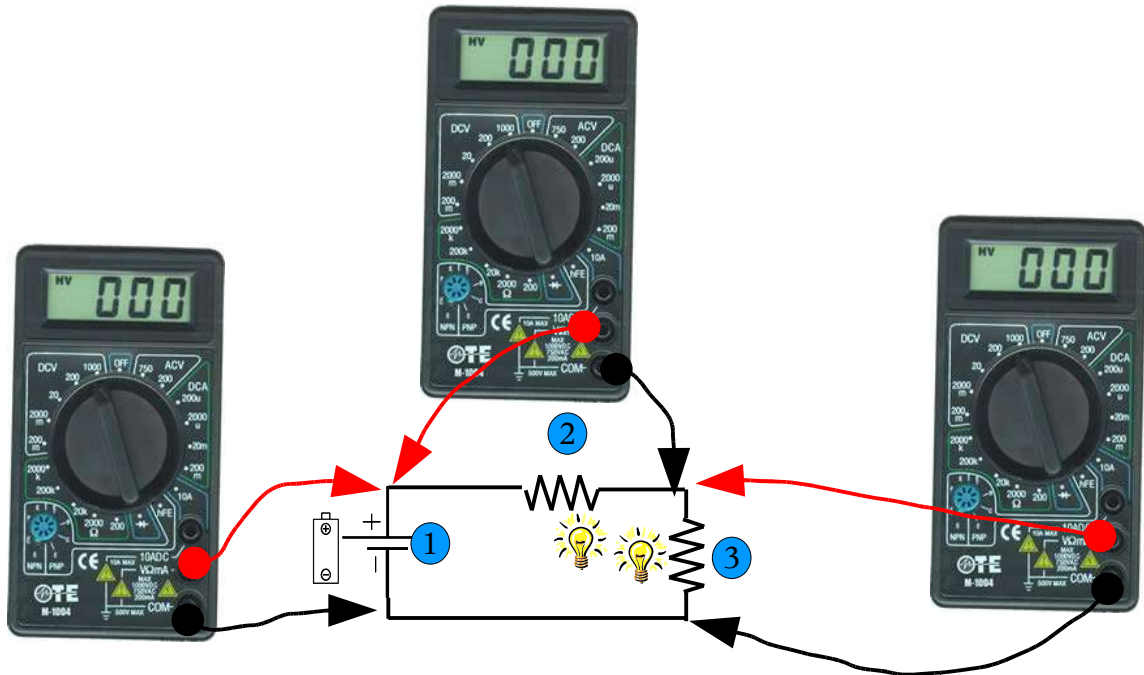
Position 1 voltage:	Position 1 current:
Position 2 voltage:	Position 2 current:
Position 3 voltage:	Position 3 current:

Compare the voltage at position 1 with that at 2 and 3. Compare the currents also. Are the light bulbs brighter when compared to the circuit of question 2? Explain.

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Please explain what you see with the voltage and current values in the table above.

8. Connect your circuit as shown and measure the voltages and currents at positions 1, 2, and 3.



Are the light bulbs in a series or parallel configuration?

Position 1 voltage:	Position 1 current:
Position 2 voltage:	Position 2 current:
Position 3 voltage:	Position 3 current:

Compare the voltage at position 1 with that at 2 and 3. Compare the currents also. Add the voltages at 2 and 3 and compare with 1 and explain.

Are the light bulbs brighter when compared to the circuit of question 2? Explain using the terms voltage and current.

Please explain what you see with the voltage and current values in the table above.

# Parallel/Series Lab

## Parallel/Series Lab Post-assessment

Name: \_\_\_\_\_

1. Please draw 2 batteries in series.
2. Please draw 2 batteries in parallel.
3. Please draw 2 light bulbs in series.
4. Please draw 2 light bulbs in parallel.
5. Will the voltage of 2 batteries be greater when in series or in parallel? Why?
6. Assume each battery is 6v. What would the measured voltage be in series and in parallel?  
Series voltage:  
Parallel voltage:
7. Would light bulbs connected in series or parallel be brighter?
8. Will the current of 2 batteries be greater in series or in parallel? Why?
9. Assume each battery can provide 2A (amps) of current to a light bulb circuit. What would the measured current be in series and in parallel?  
Series voltage:  
Parallel voltage:
10. Do electrons flow from positive to negative or negative to positive?
11. Explain what happens when you put 2 batteries in series in terms of voltage and current.  
Current:  
Voltage:

## Parallel/Series Lab

12. Explain what happens when you put 2 batteries in parallel in terms of voltage and current.

Current:

Voltage:

13. Explain what happens when you put 2 light bulbs in series in terms of voltage and current.

Current:

Voltage:

14. Explain what happens when you put 2 light bulbs in parallel in terms of voltage and current.

Current:

Voltage: