VOLTAGE IN SERIES

1. Connect 1 cell in a loop with 1 bulb.
2. Connect a voltmeter to measure the potential difference around the cell. Remember that the voltmeter is connected *in parallel* \_\_\_\_\_\_\_\_\_\_mV.
3. Add a 2nd bulb in series. What happens to bulb brightness? (same/brighter/dimmer) \_\_\_\_\_\_\_\_\_\_\_\_\_
4. Add a 2nd *cell* in series. What happens to bulb brightness? \_\_\_\_\_\_\_\_\_\_\_\_
5. Measure the potential difference around the two cells: \_\_\_\_\_\_\_\_\_\_\_\_mV
6. Connect 3rd cell in series. What happens to bulb brightness? \_\_\_\_\_\_\_\_\_\_\_
7. Measure the potential difference around the three cells (this is the total voltage) : \_\_\_\_\_\_\_\_\_
8. Draw the circuit diagram of your set up that includes: 3 cells, 2 bulbs, voltmeter measuring potential difference around the 3 cells.
9. Keeping the three cells connected, measure the potential difference around the first bulb: \_\_\_\_\_\_\_\_. Do the same for the 2nd bulb: \_\_\_\_\_\_\_\_\_\_
10. How does the voltage around the first bulb compare to voltage of the second bulb? Circle one: Same / More / Less
11. SUMMARIZE your findings by filling in the blanks:
    1. When cells are added in series bulb brightness \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    2. When cells are added in series the total voltage \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    3. Voltages across each load in series Are equal to / Add up to the total voltage supplied by the cells.

VOLTAGE IN SERIES

1. Build a new circuit that has 3 cells in parallel and 2 bulbs in series.
2. Measure the *total* potential difference. \_\_\_\_\_\_\_\_\_\_\_. Is this more/less/same as when in cells are in series?
3. Measure the potential difference across any bulb: \_\_\_\_\_\_\_\_\_\_\_
4. How does this compare to another bulb? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Predict what the voltage would be across a 3rd bulb if added\_\_\_\_\_
6. If each cell should be about 1.5V, Predict what the total voltage would be if you had 4 cells in parallel? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Draw a circuit diagram representing 3 cells in parallel and 3 bulbs in parallel with a voltmeter measuring the potential difference across one bulb. Indicate what value the voltmeter would read on your diagram:

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SUMMARISE:

What happens to total voltage when more cells are added in parallel? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_