

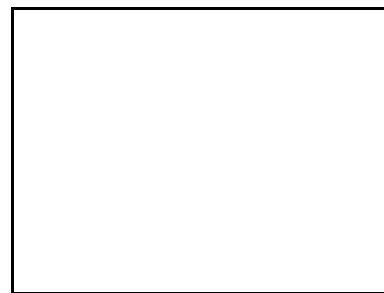
Lesson 4:

Cells & Batteries

Sources in Series and Parallel

Sources Connected in Series

- 1) In the box to the right, draw a schematic diagram of three sources and a light bulb connected in series
- 2) Connecting sources in series will cause the voltages to _____.
- 3) The voltages add if sources are connected in _____
- 4) Sources connected in series will cause the current through a light bulb to _____.
- 5) As more sources are connected in series to a light,
 - A) the brightness of the bulb will _____
 - B) the current will _____
 - C) the voltage across the light will _____
- 6) If one of TWO sources connected in series to a light, is reversed, the voltage will _____ and the current will _____. Draw a schematic diagram of this in the box to the right.



Sources Connected In Series



Sources Connected In Series - One Reversed

Sources Connected in Parallel

- 1) In the box to the right, draw a Schematic diagram of three sources connected in parallel.
- 2) Connecting sources in parallel will cause the voltage to _____
- 3) Sources connected in parallel does not change the _____ through the load.
- 4) The cells in a battery are connected in parallel in order to make each cell _____
- 5) As more sources are connected in parallel to a light,
 - A) the brightness of the light will _____
 - B) the current through each bulb will _____
 - C) the voltage across the bulb will _____
- 6) If one of THREE sources connected in parallel to a light, is reversed, the voltage across the light will _____ and the current through the light will _____. The current through the reversed source will _____. Draw a schematic circuit diagram of this.



Sources Connected In Parallel



Sources Connected In Parallel - One Reversed

Cells and Batteries

- 1) What is the difference between a cell and a battery?
- 2) The cells in a battery are connected in _____, in order to make each cell last longer.

3) Draw a schematic of the cells in a 9 V battery made from 1.5 V cells.



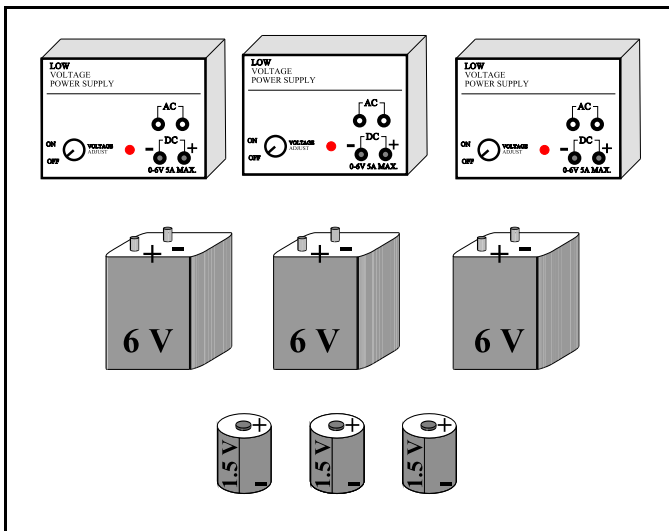
9 Volt Battery



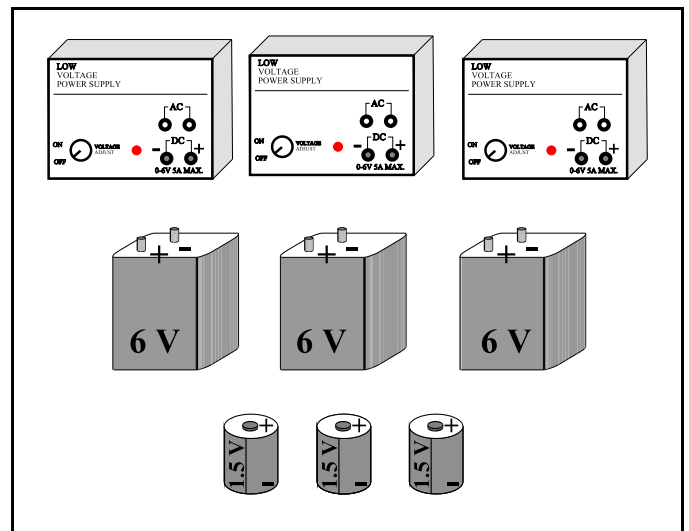
6 Volt Lantern Battery

- 4) Draw a schematic of the cells in a 6 V lantern battery made from 8(eight) - 1.5 V cells.
- 5) The cells of a 6 V lantern battery connected in series in order to increase _____
- 6) The cells of a 6 V lantern battery connected in parallel in order to increase _____

7) Hook up the following sources as indicated

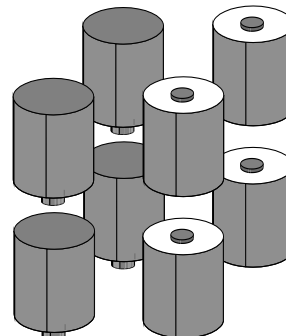
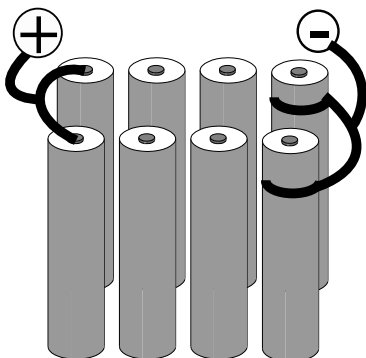


SERIES

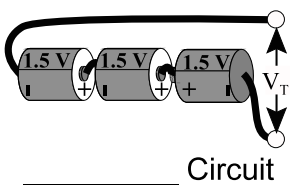


PARALLEL

8) Hook up the following cells of a 6 V lantern battery . Show where the exterior terminals would be.

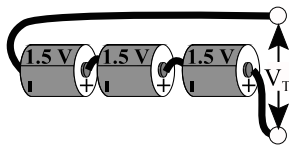


9) State whether the following sources are a SERIES OR PARALLEL connection and indicate the TOTAL VOLTAGE.



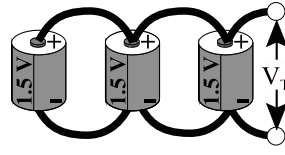
_____ Circuit

$V_T = \text{___} \text{ V}$



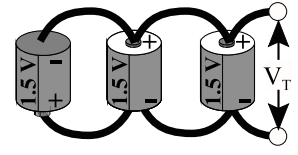
_____ Circuit

$V_T = \text{___} \text{ V}$



_____ Circuit

$V_T = \text{___} \text{ V}$



_____ Circuit

$V_T = \text{___} \text{ V}$

Research the five different sources of electric voltage. These are the only ways that have been found to push electrons around a circuit.

OTHER TYPES OF SOURCES		
Energy Form Involved	SOURCE Device Converting Other Forms Of Energy Into Electrical Energy	LOAD Device Converting Electrical Energy Into Other Forms Of Energy
Magnetic (with mechanical movement)		
Chemical		
Light		
Heat		
Mechanical Distortion of Crystal Lattice		