

EE-101

Battery, Switch, Lamp Circuit

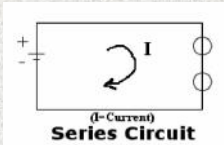


Switch in "Off" Position
(Source: IEEE Virtual Museum)

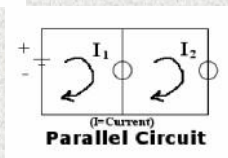
Switch in "On" Position
(Source: IEEE Virtual Museum)

See page 8 of Lesson Plan 14 "Flashlights and Batteries"

Series & Parallel Circuit

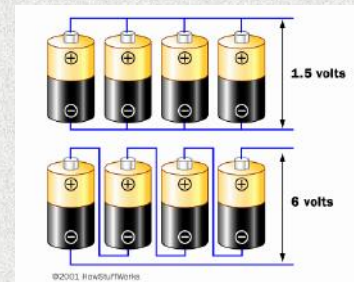


(I-Current)
Series Circuit



(I-Current)
Parallel Circuit

Battery Parallel & Serial Circuits



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Battery Power

If you arrange four of these 1.25-volt, 500 milliamp-hour batteries in a serial arrangement, you get 5 volts (1.25 x 4) at 500 milliamp-hours. If you arrange them in parallel, you get 1.25 volts at 2,000 (500 x 4) milliamp-hours.

Have you ever looked inside a normal 9-volt battery?



Manufacturers caution against disassembling batteries, to avoid personal injury. However, a partially disassembled 9-volt battery would look like this.

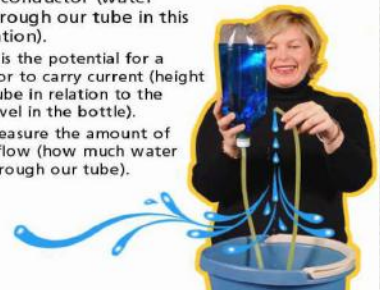
It contains six, very small batteries producing 1.5 volts each in a serial arrangement!

<http://electronics.howstuffworks.com/battery9.htm>

Water Demonstration

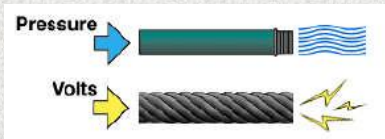
► Current is the flow of electrons through a conductor (water flowing through our tube in this demonstration).

- Voltage is the potential for a conductor to carry current (height of the tube in relation to the water level in the bottle).
- Amps measure the amount of current flow (how much water flows through our tube).



Micron Lesson Plan on Electricity

Current Flow



Electrical current is the flow of electric charge through a substance that conducts electricity. Volts, amps, and watts measure electricity. Volts measure the "pressure" under which electricity flows. Amps measure the amount of electric current. Watts measure the amount of work done by a certain amount of current at a certain pressure or voltage.

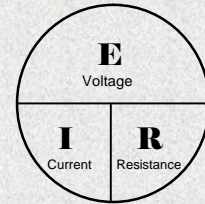
<http://www.solcomhouse.com/electricity.htm>

OHMS LAW

$$E = I \times R$$

$$I = E/R$$

$$R = E/I$$



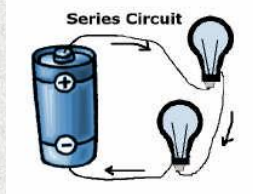
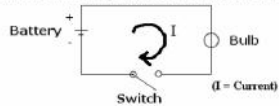
VOLTAGE = (CURRENT) X (RESISTANCE)

CURRENT = (VOLTAGE) ÷ (RESISTANCE)

RESISTANCE = (VOLTAGE) ÷ (CURRENT)

Simple Series Circuit

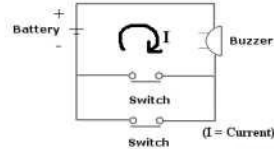
Schematic Diagram of a Simple Circuit



What is wrong with this Schematic Diagram?

Two Button Buzzer Circuit

Two Button Buzzer Schematic

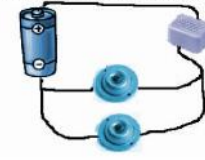


Note: switches are connected as a parallel circuit

Which switches will activate the buzzer?

See page 7 of Lesson Plan 10 "Two Button Buzzer Circuit"

Two Button Buzzer Simulation



Flash Light

See page 9 of Lesson Plan 14 "Flashlights and Batteries"



What type of circuit does it use?

Solid Conductor Testing Setup

Solid Conductor Testing Setup



See page 7 of Lesson Plan 8 "Insulators and Conductors"