Announcements

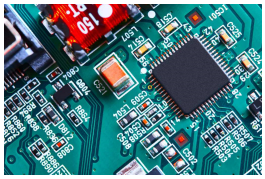
* Please bring a 2-liter soda bottle by next Monday

PRACTICE	LABS	TESTS
Practice Problems (1-15, 21-32)	• Electrostatic Interactives • VIR Interactive	Unit 14 Test Thursday (5/9/19)

Circuits

Learning Target

14.4 I can describe, interpret, and solve problems involving series and parallel circuits.



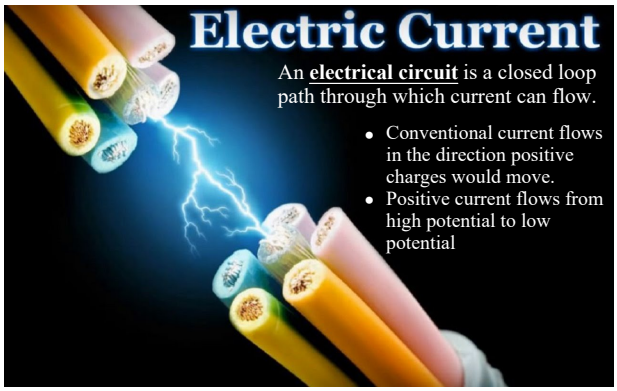
ADVANCED PLACEMENT PHYSICS 1 EQUATIONS

Electron charge magnitude, $e = 1.60 \times 10^{-19}$ C

Coulomb's law constant, $k = 1/4\pi\varepsilon_0 = 9.0 \times 10^9$ N·m^2/C^2

$$|\vec{F}_E| = k\left|\frac{q_1 q_2}{r^2}\right| \qquad I = \frac{\Delta q}{\Delta t} \qquad R = \frac{\rho \ell}{A} \qquad I = \frac{\Delta V}{R} \qquad P = I\,\Delta V$$

A = area
F = force
I = current
ℓ = length
P = power
q = charge
R = resistance
r = separation
t = time
V = electric potential
ρ = resistivity



Electrical Circuits

Representing circuits in multiple forms.

Words

A 12-V car battery is connected to one of the car's 3- brake lights. The circuit is completed by a connection to an ammeter, which is a device that measures current.

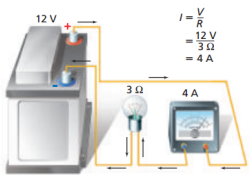
Electrical Circuits

Representing circuits in multiple forms.

Words

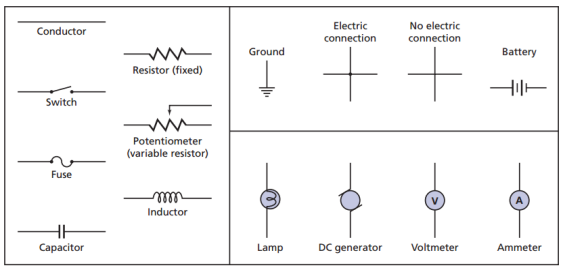
A 12-V car battery is connected to one of the car's 3- brake lights. The circuit is completed by a connection to an ammeter, which is a device that measures current.

Drawing



Diagramming Circuits

Most frequently, however, an electric circuit is drawn using standard symbols for the circuit elements.



Diagramming Circuits

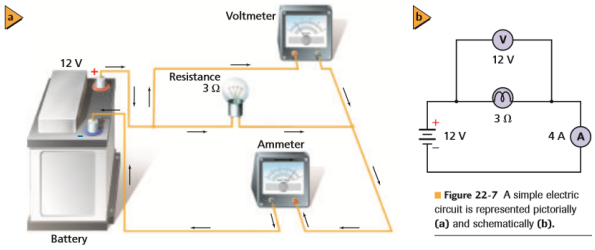
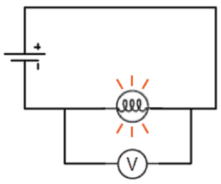


Figure 22-7 A simple electric circuit is represented pictorially (a) and schematically (b).

Voltmeters

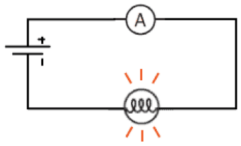
Voltmeters are tools used to measure the potential difference between two points in a circuit.



- The voltmeter is connected in parallel with the element to be measured.
- You can remove the voltmeter from the circuit without breaking the circuit.
- Voltmeters have very high resistance so as to minimize the current flow through the voltmeter and the voltmeter's impact on the circuit.

Ammeters

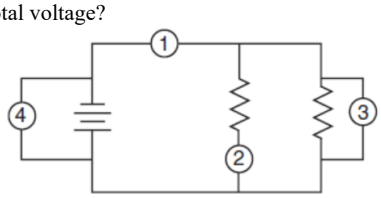
Ammeters are tools used to measure the current in a circuit.



- The ammeter is connected in series with the circuit, so that the current to be measured flows directly through the ammeter.
- The circuit must be broken to correctly insert an ammeter.
- Ammeters have very low resistance to minimize the potential drop through the ammeter.

Question

In the electric circuit diagram below, possible locations of an ammeter and a voltmeter are indicated by circles 1, 2, 3, and 4. Where should an ammeter be located to correctly measure the total current and where should a voltmeter be located to correctly measure the total voltage?



PRACTICE

Series and Parallel Circuit Interactives