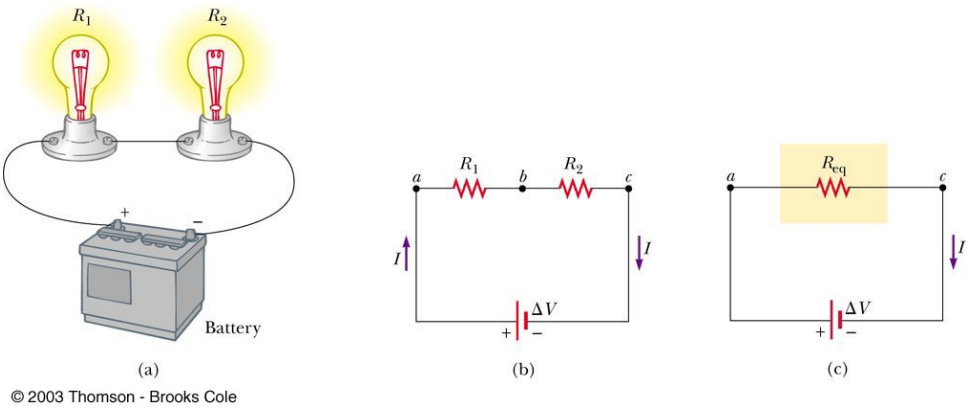
Chapter 18

Direct Current Circuits

A source that maintains a current in a closed circuit is called an emf or “charge pump”. A common source is a battery. These sources provide voltage or electric potential measured in volts.

Within a circuit, resistors can be arranged in series or parallel.

In **series**, the current is the same in all the resistors.

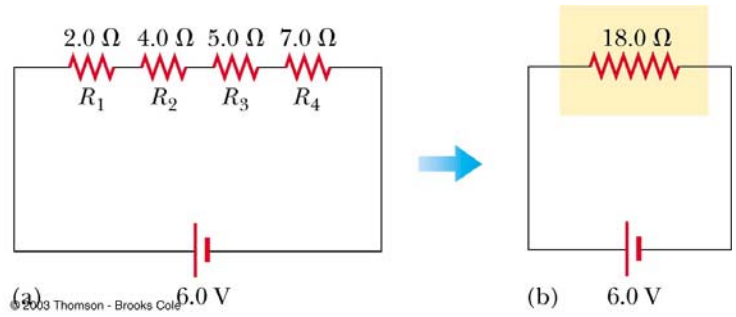


The equivalent resistance of a series combination of resistors is the algebraic sum of the individual resistors.

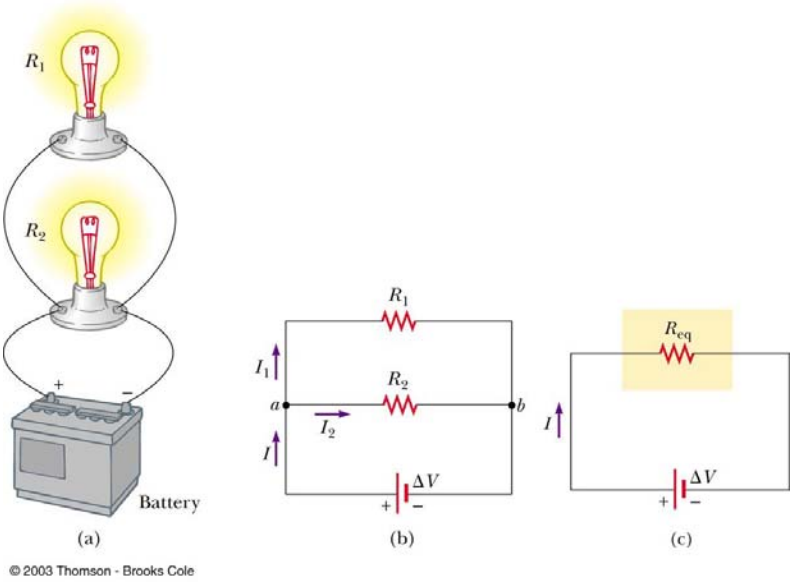
R_{eq}=R1+R2+…

V=IR across each one

$I_1=I_2=I_3$….



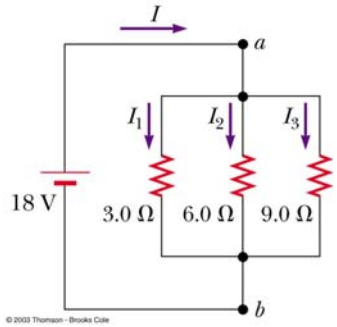
In **parallel,** the current branches depending on the resistance in the branch. The inverse of the equivalent resistance of a parallel branch is the inverse of the algebraic sum of the individual resistances.



$1/R_{eq}=1/R_1+1/R_2+\ldots.$

$V_1=V_2=\ldots..$

I=V/R for each branch



Combination circuits with series and parallel resistors: