

## Ideal versus Effective Voltage

In order to move along a path in a circuit, electrons must have energy. This energy comes from the chemical reaction inside the battery that forces positive and negative charges apart.

Recall:

Work done on each charge = voltage  
This is the ideal voltage or emf

$$V = \frac{W}{Q}$$

But a battery has some resistance, so some voltage is used inside the battery itself.

So...

Ideal voltage (emf) > Effective (actual) voltage

\*Voltage is measured with a Voltmeter.