

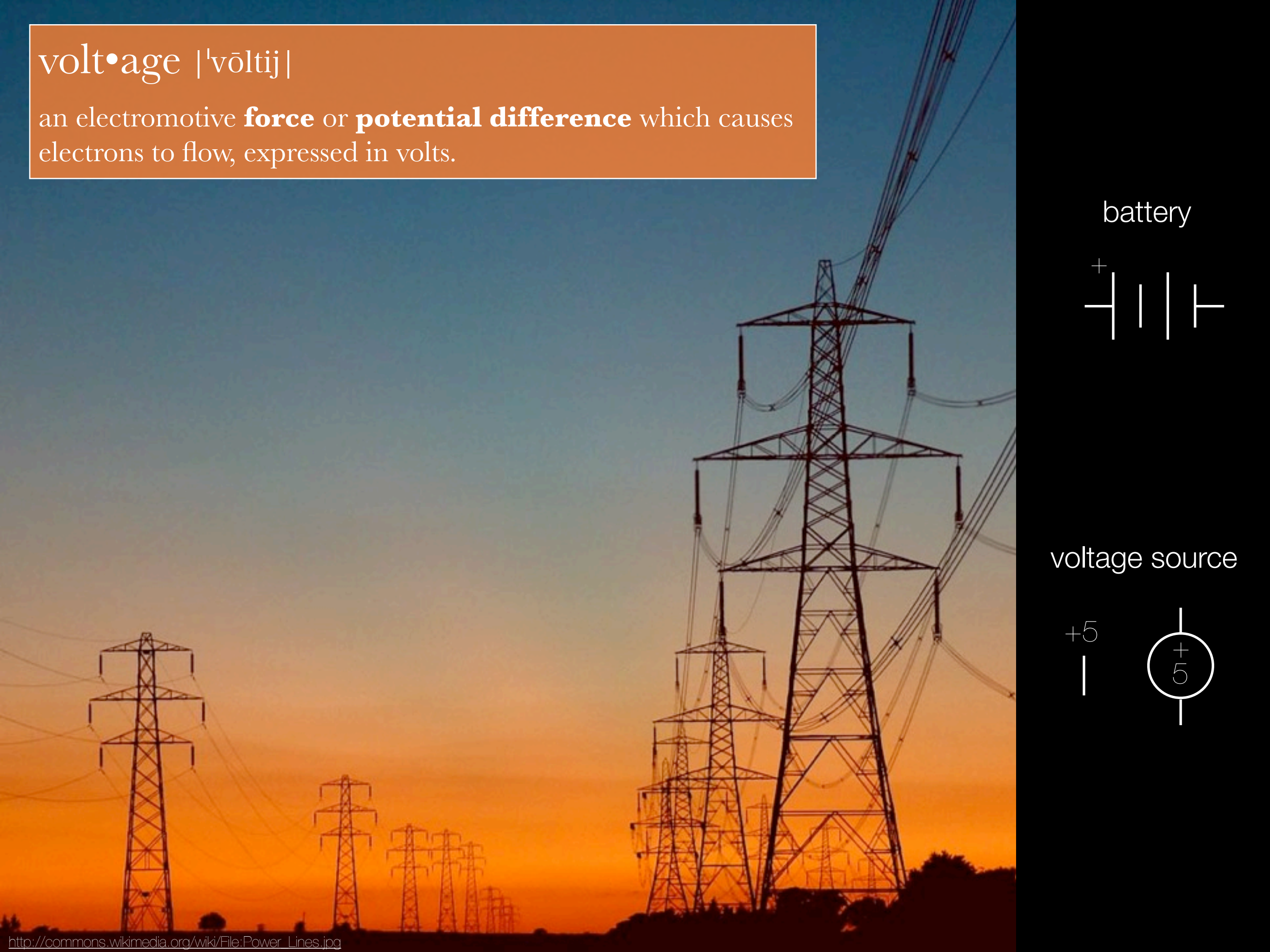
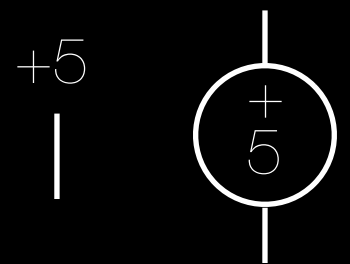
volt•age |'vōltij|

an electromotive **force** or **potential difference** which causes electrons to flow, expressed in volts.

battery



voltage source



cur•rent |'kərənt; 'kə-rənt|

a quantity representing the **rate of flow** of electric charge, usually measured in Amperes.

$i \rightarrow$





re•sist•ance |ri'zistəns|

the degree to which a substance or device **opposes** the passage of an electric current, causing energy dissipation.



resistor

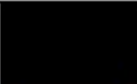









100Ω



Ohm's Law

The voltage drop across a conductor is equal to the product of the resistance and the current flowing through the conductor ($V=IR$).


$$R = ab \times 10^c$$

			Multiplier
BLACK		0	_____
BROWN		1	_____0
RED		2	_____00
ORANGE		3	_____000
YELLOW		4	__0,000
GREEN		5	_00,000
BLUE		6	000,000
VIOLET		7	
GRAY		8	
WHITE		9	

EXAMPLE
 47,000 Ohms
 or
 47-K Ω

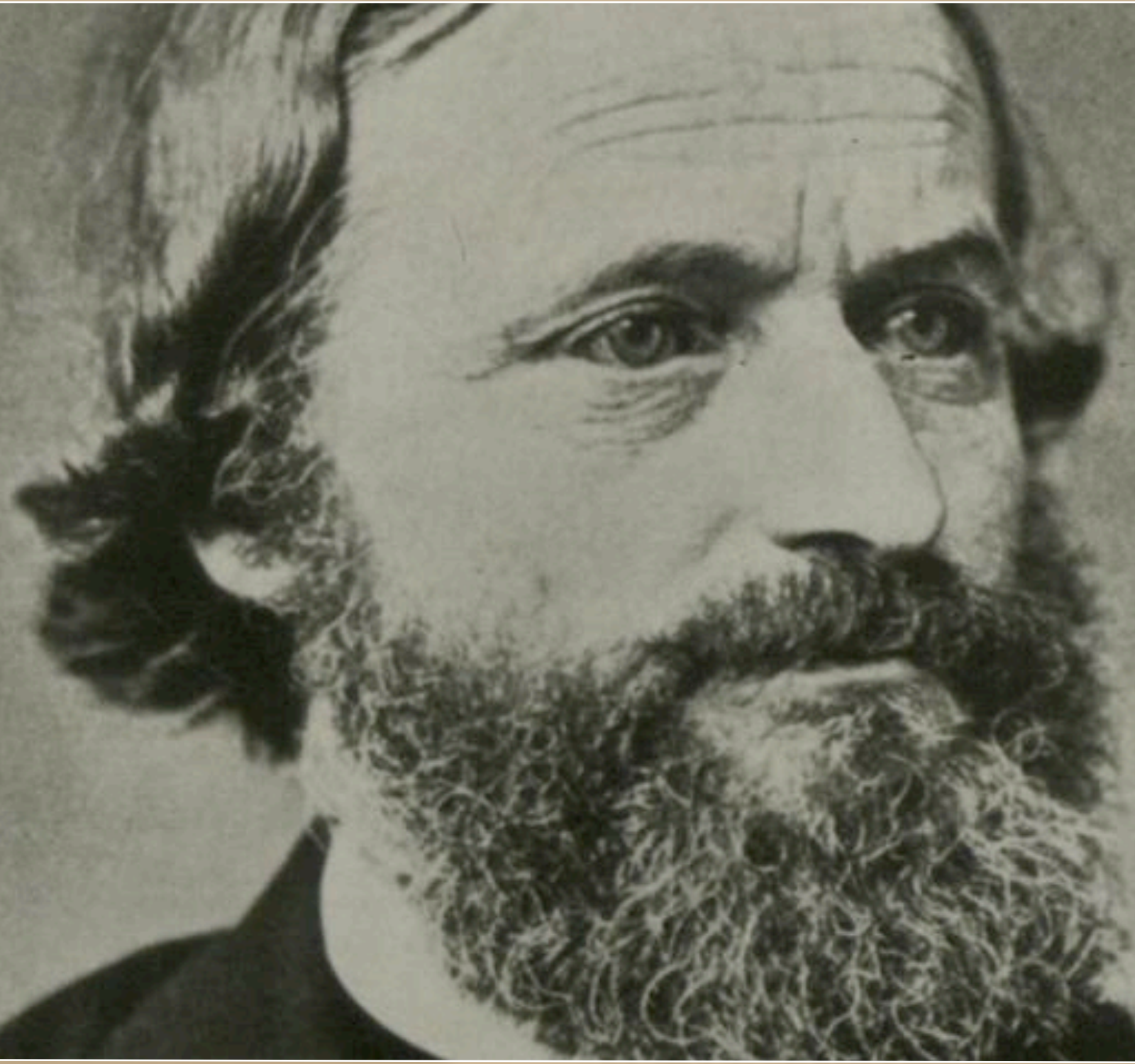
1st Digit — 4
 2nd Digit — 7
 Multiplier — 000
 Tolerance — 2% - Red

5% - Gold
 10% - Silver



Kirchoff's Voltage Law

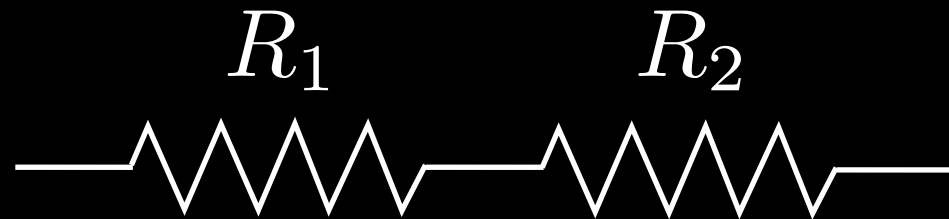
The sum of the voltage changes in a loop must equal zero.



Kirchoff's Current Law

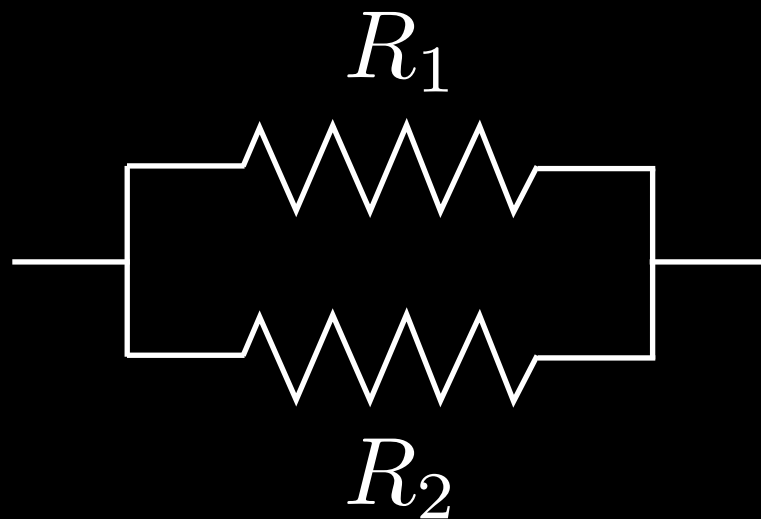
The sum of the currents flowing into and out of a node must equal zero.

series resistors



$$R = R_1 + R_2$$

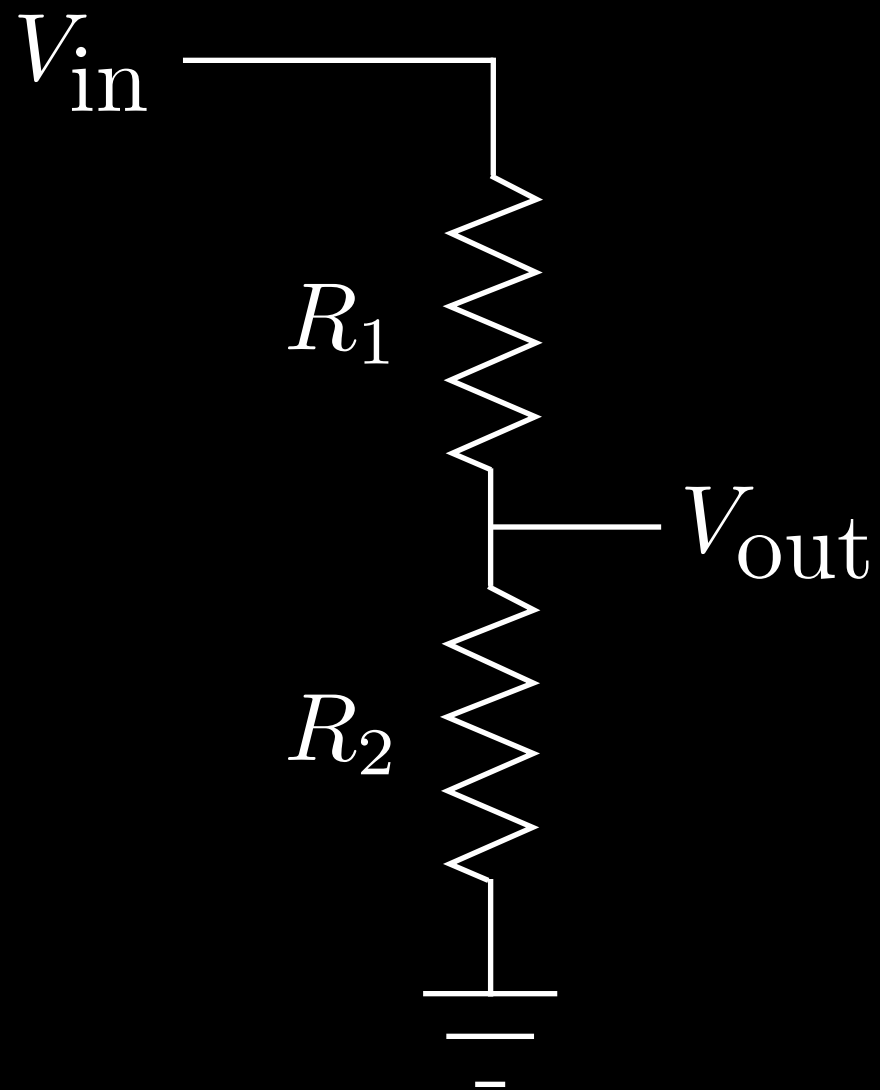
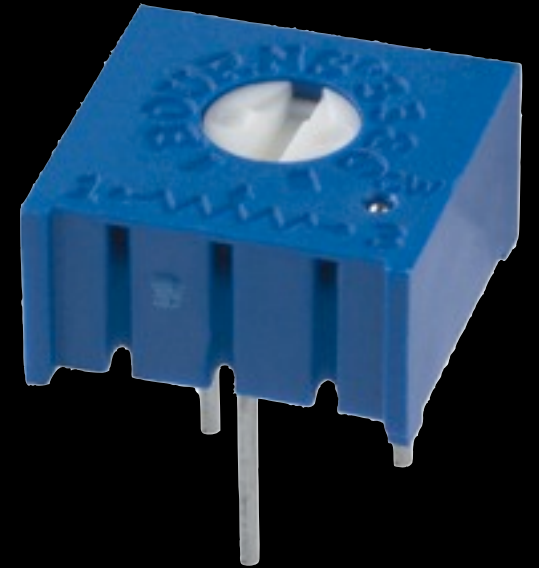
parallel resistors



$$R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}} = \frac{R_1 R_2}{R_1 + R_2}$$

Voltage Divider

Passive linear circuit that produces an output voltage that is a fraction of the input voltage.



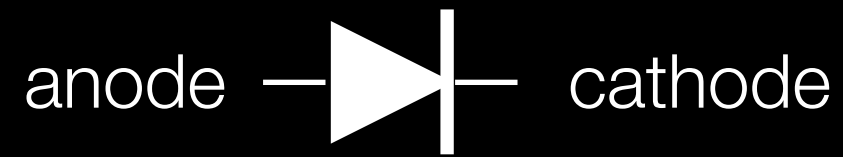
$$V_{out} = \frac{R_2}{R_1 + R_2} V_{in}$$

assuming the output
draws NO CURRENT

di•ode |'dī,ōd|

noun Electronics

a semiconductor device which allows current to flow in only one direction.

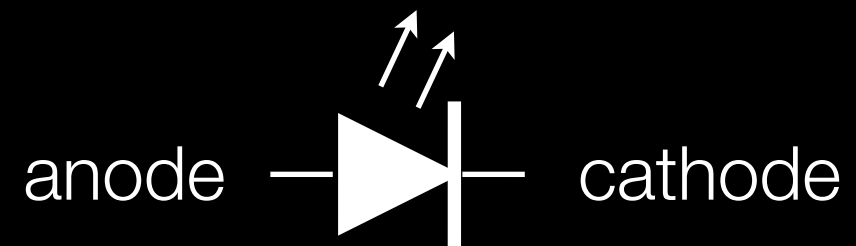


current flows from anode to cathode

fixed voltage drop (typ. 0.6V)

reverse breakdown

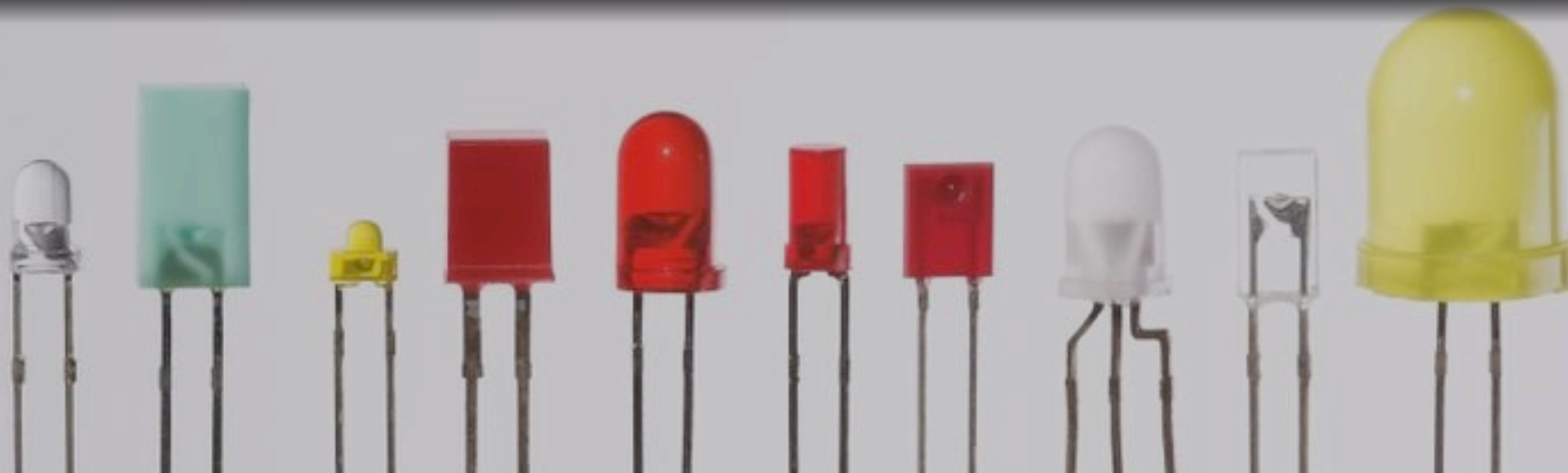
Light-Emitting Diodes



max continuous current ~ 20 mA

forward voltage varies with color (1.2-3.0V)

reverse breakdown voltage ~ 5V



PC Interface with the Phidget InterfaceKit 8/8/8

