

EECS 16A

10.3 LECTURE 11

ELECTRONIC INFORMATION SYSTEMS



ELECTRICITY

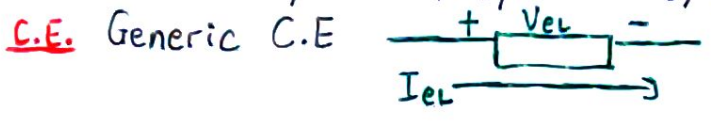
Electrons!

- UNIT** Voltage [V] Volts
- UNIT** Current [I] Ampère

Analogous to Pressure
 Analogous to Water

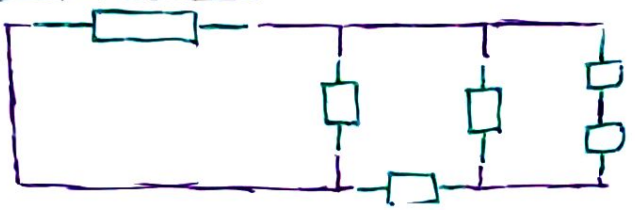
CIRCUIT ELEMENTS

Resistors, switches, batteries, etc.



In 16A, we use the
 Passive Sign Convention:
 Currents flow + to -.

CIRCUIT DIAGRAMS



nodes (4)
 branches (6)

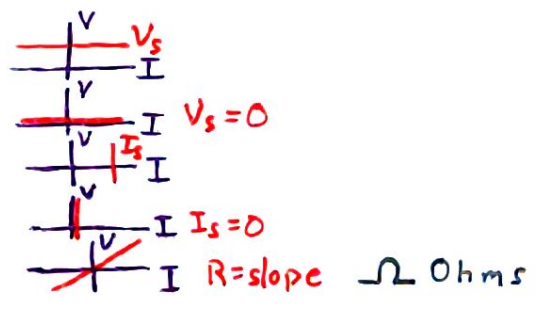
KIRCHHOFF

- DEF** CURRENT LAW: All currents entering a node equal the sum of all currents existing that node.
- DEF** VOLTAGE LAW: Voltages around all loops sum to zero.

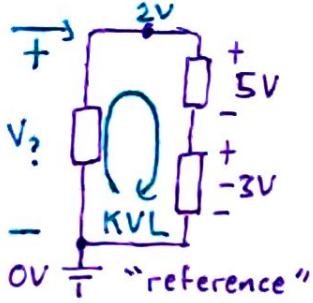
BASIC CES

- C.E.** Voltage source $V_s \phi^+ \text{Vel} \downarrow I_{el}$
- C.E.** Wire/Short Circuit
- C.E.** Current source $I_s \phi \downarrow I_{el} \text{ } ^+ \text{Vel}$
- C.E.** Open Circuit
- C.E.** Resistor [R] $\text{ } ^+ \text{Vel} \text{ } - \text{ } I_{el}$

$$R = \frac{V_{el}}{I_{el}}$$



NODE VOLTAGE



$$V? - 5V + 3V = 0$$

$$V? = 2V$$

"node voltage"