

Week 5 Cribsheet INTRO TO CIRCUITS

Key Definitions

- Voltage (V)** is potential difference between two points [unit: volts (V)]
- Current (I)** is flow rate of electrons [unit: Amperes (A)]
- Resistance (R)** is how much something limits current [unit: ohms (Ω)]
- Passive sign convention**: the current arrow goes from + to - labels

Some Circuit Elements



Resistor

$$V = IR \text{ (Ohm's Law)}$$



Voltage Source

fixed V_s



Current Source

fixed I_s



Wire / short

$$\Delta V = 0$$



Open Circuit

$$I = 0$$



Ground

$$V = 0$$

Kirchoff's Laws

Kirchoff's Voltage Law (KVL): sum of voltage drops across loop is zero

Kirchoff's Current Law (KCL): net current through any node is zero