Basic circuits:

$V = IR$

- V: Voltage = electric potential (V - Volts)
- I: current (Amperes)
- R: resistance (Ω - ohms)

-||- (+ / −) = battery (generates voltage)

— = wire (carries current - conductor - equipotential surface)

-VVV- = resistor

-||- = capacitor

Resources
https://www.allaboutcircuits.com/worksheets/simple-circuits/

Worksheets / exercises:
http://mrsfranklinclassroom.weebly.com/uploads/1/3/3/9/13393756/11-4_worksheet.pdf
http://www.mysciencesite.com/Middle_School_Science_-_Basic_Circuits.pdf
https://www.livingston.org/cms/lib9/NJ01000562/Centricity/Domain/833/circuitsolutions.pdf
3000 solved problems in physics, chapter 27

	Series	Parallel
Voltage	$V_t = V_1 + V_2 + V_3 + \ldots$	$V_t = V_1 = V_2 = \ldots$
Current	$I_{tot} = I_1 = I_2 = \ldots$	$I_{tot} = I_1 + I_2 + \ldots$
resistance	$R_{tot} = R_1 + R_2 + R_3 + \ldots$	$\frac{1}{R_{tot}} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$
capacitance	$\frac{1}{C_{tot}} = \frac{1}{C_1} + \frac{1}{C_2} + \ldots$	$C_{tot} = C_1 + C_2 + \ldots$

https://byjus.com/physics/difference-between-series-and-parallel-circuits/

microscopic formula for resistance:

$R = \rho \frac{L}{A}$

Series: one long resistor
Parallel: one wide resistor

Microscopic formula for capacitance

$C = \frac{\kappa \epsilon_0 A}{d}$

Series: increase d
Parallel: increase A

Power: $P = I^2 R = VI$ (Unit = W = Watts = J/s)

Use $V = IR$ to derive multiple forms