IEEE’s Hands on Practical Electronics (HOPE)
Week 3: Ohm’s Law, Equivalent Resistance

Definitions:
Ohmic: has a behavior that obeys ohm’s law
Series: Connected one right after another; cascaded
Parallel: Both terminals are connected to the same two points on the circuit

Equations:
Ohm’s Law: \( R = \frac{V}{I} \)
Other forms of Ohm’s law: \( V = IR \) or \( I = \frac{V}{R} \)
For resistors in series: \( R_{\text{total}} = R_1 + R_2 + \ldots + R_n \)
For resistors in parallel: \( \frac{1}{R_{\text{total}}} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots + \frac{1}{R_n} \)

Notation:
Resistors in parallel are often written as \( R_1//R_2 \) instead of expanding it with the equation above.

Example:

\( R_{\text{total}} \) for resistors in series:

\[
R_{\text{total}} \text{ is equal to the sum of } R_1 + R_2
\]

\( R_{\text{total}} \) for resistors in parallel:

\[
\frac{1}{R_{\text{total}}} = \frac{1}{R_1} + \frac{1}{R_2}
\]

To find \( R_{\text{total}} \), take the inverse of \( \frac{1}{R_{\text{total}}} \)