

Name: _____

Electronics Quiz #1

1. Write down Ohm's Law

$$V = I * R$$

2. How many milliamps is 1.3 amps?

$$1A = 1,000mA. \quad 1.3 * 1,000 = \mathbf{1,300 \text{ mA}}$$

3. How many amps is 3.5 milliamps

$$1mA = 0.001A. \quad 3.5 * 0.001 = \mathbf{0.0035A}$$

4. If I have a voltage source of 7V with 2,000Ω of resistance, how much current will be flowing?

$$I = V / R = 7 / 2,000 = \mathbf{0.0035A \text{ or } 3.5mA}$$

5. If I have two 500Ω resistors *in series*, how much resistance do they have together?

$$\text{For series resistances, just add - } 500 + 500 = \mathbf{1,000\Omega}$$

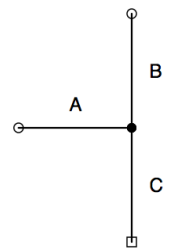
6. If I have two 600Ω resistors *in parallel*, how much resistance do they have together?

$$\text{For parallel resistances, } R_T = 1 / (1/R_1 + 1/R_2) = 1 / (1/600 + 1/600) = 1 / (2/600) = 600/2 = \mathbf{300\Omega}$$

7. Draw a circuit with a 5V battery that has 5 milliamps of current flowing

Such a circuit has a **battery and a 1,000Ω resistor in series.**

8. In the drawing to the right, three wires are joined at a point. If 15 milliamps is entering in through wire A and 5 milliamps are leaving through wire B, is the current in wire C entering or leaving the junction, and how much current?



15 entering through A, 5 leaving through B, that leaves 15 - 5 = 10mA unaccounted for, so **10mA must be leaving through C.**

9. In the drawing to the right, there is a 3V voltage drop across R1, a 2V voltage drop across R2, a 1.5V voltage drop across R4 and a 2.5V voltage drop across R6. How large is the voltage drop across R5?

The path down the middle through R1 and R2 is $3 + 2 = 5V$. Kirchoff's Voltage Law states that the same amount of voltage drop will happen through any other route between these same points. Going around the outside, we have a 1.5V drop across R4, an unknown drop across R5, and a 2.5V drop across R6. Since this route must be equal to the other route, the drops across R4, R5, and R6 must total 5V as well. Therefore, $1.5 + X + 2.5 = 5$ where X is the unknown voltage drop across R5. Simplifying, $4 + X = 5$. Solving, $X = 1$. Therefore, **R5 has a 1V voltage drop.**

