

Ohm's Law and Resistance Exploratory

1. Go to <http://phet.colorado.edu/web-pages/index.html> (or use the Exploratory Webpage link on the Unit 12 webpage.)
2. Click on the "Play with sims..." button.
3. Click on the "Physics" link in the left frame of the page.
4. In the right frame, scroll down to find the "Ohm's Law" application and select it. You may select the "Run Now!" option.
5. Set the "Resistance" to 500 Ω . Set the "Voltage" to 4.0 V.
6. Only vary one quantity at a time. Make a table showing voltage, resistance, and current for different values of voltage.
 - As voltage goes up, what happens to current?
 - As voltage goes down, what happens to current?
 - Which variable is the control in this experiment?
7. Vary the values of resistance while holding voltage constant at 4.0 V. Make a table showing voltage, resistance, and current for different values of resistance.
 - As resistance goes up, what happens to current?
 - As resistance goes down, what happens to current?
 - Which variable is the control in this experiment?
8. Now open the "Resistance" in a "Wire" application.

9. Design three experiments. Vary only one measurement at a time. Draw three tables showing resistance, resistivity, length, and area. Each table should show the effect of varying one of the variables while keeping the others constant.

- How is resistance affected by resistivity, length, and area?

10. Open the “Signal Circuit” application.

11. Close the “Switch.”

- Describe how the electrons move in the circuit when the switch is closed. Does the electrical signal move rapidly?