**Resistance of a metal wire** Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Purpose: Investigate the [resistance](http://hyperphysics.phy-astr.gsu.edu/hbase/electric/resis.html) of a metal wire as a function of its dimensions.

Apparatus: Digital multimeter ([DMM](http://www.youtube.com/watch?v=bF3OyQ3HwfU)), one long (nichrome) wire, connector box, banana-plug wires (2), and meter stick.

Procedure:

1. Set the DMM to measure resistances (use 200-Ω) and connect two banana-plug wires from it to the connector box.

2. Connect one end of the long metal wire to one of the terminals of the connector box.

3. Measure 10 cm length of wire, (do not cut the wire) and connect it to the other terminal so that there is exactly 10 cm of wire between the terminals.

4. Create an Excel data table, first column for length, L and second for resistance, R.

5. Record the length and resistance data and repeat procedure-3 for other lengths, 9 more times.

6. Plot a graph R versus L, determine its slope, and attach a hard-copy of your data table and graph.

  Slope of R versus L = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Now that you have seen what happens to the resistance as the length increases, can you predict what will happen to the resistance as the diameter increases?

PREDICTION:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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8. Check your prediction by doing an appropriate activity.

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9. Electricity is transported across long-distances using [power lines with thick wires](http://www.energyquest.ca.gov/story/chapter07.html). Explain why?

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