

## Investigating Resistance with Play-Doh

Name: \_\_\_\_\_ Block: \_\_\_\_ Date: \_\_\_\_\_

### Background

The resistance of a conductor depends on four basic factors including the material from which the conductor is made. Metals are typically good conductors but some metals (e.g. Ag, Cu, Al) are better than others (e.g. Pb, Ge, C) depending on how tightly their valence electrons are bound to the atom. The temperature of the material also matters and as temperature increases, the excited atoms' vibrations decrease the conductivity of the material. The other two factors are what you are going to investigate today.

### Your Challenge

Using Play-Doh as your conductive material (instead of metal wires), a 9-Volt battery, and some LEDs (all the same color) devise some experiments to discover what other properties of a "wire" also affect its resistance. Use the brightness of your LEDs to indicate the resistance of the Play-Doh as you've formed it—with dimmer LEDs indicating more resistance.

Use the space below to draw your electric circuits for your experiments. You must describe how you changed the Play-Doh to affect the resistance and how that change either increased or decreased the resistance. Remember, you're trying to find at least two other properties that will affect resistance in your "wires."

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