Electrical Components

Unit: Electricity & Magnetism
NGSS Standards: HS-PS2-6
MA Curriculum Frameworks (2006): 5.3
AP Physics 1 Learning Objectives: N/A

Knowledge/Understanding Goals:
- recognize common components of electrical circuits

Language Objectives:
- Recognize and be able to name and draw symbols for each of the electrical components described in this section.

Labs, Activities & Demonstrations:
- Show & tell with actual components.

Notes:

electrical component: an object that performs a specific task in an electric circuit.

A circuit is a collection of components connected together so that the tasks performed by the individual components combine in some useful way.

circuit diagram: a picture that represents a circuit, with different symbols representing the different components.
The following table describes some of the common components of electrical circuits, what they do, and the symbols that are used to represent them in circuit diagrams.

<table>
<thead>
<tr>
<th>Component</th>
<th>Symbol</th>
<th>Picture</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>wire</td>
<td><img src="wire.png" alt="Image" /></td>
<td><img src="wire.png" alt="Image" /></td>
<td>Carries current in a circuit.</td>
</tr>
<tr>
<td>junction</td>
<td><img src="junction.png" alt="Image" /></td>
<td><img src="junction.png" alt="Image" /></td>
<td>Connection between two or more wires.</td>
</tr>
<tr>
<td>unconnected wires</td>
<td><img src="unconnected.png" alt="Image" /></td>
<td><img src="unconnected.png" alt="Image" /></td>
<td>Wires cross but are not connected.</td>
</tr>
<tr>
<td>battery</td>
<td><img src="battery.png" alt="Image" /></td>
<td><img src="battery.png" alt="Image" /></td>
<td>Supplies current at a fixed voltage.</td>
</tr>
<tr>
<td>resistor</td>
<td><img src="resistor.png" alt="Image" /></td>
<td><img src="resistor.png" alt="Image" /></td>
<td>Resists flow of current.</td>
</tr>
<tr>
<td>potentiometer (rheostat, dimmer)</td>
<td><img src="potentiometer.png" alt="Image" /></td>
<td><img src="potentiometer.png" alt="Image" /></td>
<td>Provides variable (adjustable) resistance.</td>
</tr>
<tr>
<td>capacitor</td>
<td><img src="capacitor.png" alt="Image" /></td>
<td><img src="capacitor.png" alt="Image" /></td>
<td>Stores charge.</td>
</tr>
<tr>
<td>diode</td>
<td><img src="diode.png" alt="Image" /></td>
<td><img src="diode.png" alt="Image" /></td>
<td>Allows current to flow in only one direction (from + to −).</td>
</tr>
<tr>
<td>light-emitting diode (LED)</td>
<td><img src="led.png" alt="Image" /></td>
<td><img src="led.png" alt="Image" /></td>
<td>Diode that gives off light.</td>
</tr>
</tbody>
</table>

Use this space for summary and/or additional notes.
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<tbody>
<tr>
<td>incandescent lamp (light)</td>
<td>![Symbol]</td>
<td>![Picture]</td>
<td>Provides light (and resistance).</td>
</tr>
<tr>
<td>transformer</td>
<td>![Symbol]</td>
<td>![Picture]</td>
<td>Increases or decreases voltage.</td>
</tr>
<tr>
<td>fuse</td>
<td>![Symbol]</td>
<td>![Picture]</td>
<td>Opens circuit if too much current flows through it.</td>
</tr>
<tr>
<td>ground</td>
<td>![Symbol]</td>
<td>![Picture]</td>
<td>Neutralizes charge. (clamps to water pipe)</td>
</tr>
</tbody>
</table>

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