

**Circuits- Part I**  
**Introduction to Circuits: Let there be light**

[Battery and Bulb Activity](#)  
[Let There Be Light! WS](#)  
[Let There Be Light \(ppt\)](#)

**Materials**

- For each student:
- 1 D-cell battery
  - 1 3v bulb
  - 1 (or more) length(s) of wire made from aluminum foil
  - Scotch tape
  - BHSSC journals
- For each group of 4:  
 (A basket containing)
- 4 batteries
  - 4 bulbs
  - 4 pieces of wire

<b>TEKS #</b>	<b>Student Expectations</b>
8 <sup>th</sup> grade <b>2.A, B, and E</b>	<b>(2)</b> Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to: <b>(A)</b> plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology; <b>(B)</b> design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology <b>(E)</b> analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.

<p>8<sup>th</sup> grade 4.A</p>	<p><b>(4)</b> Scientific investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. The student is expected to: <b>(A)</b> use appropriate tools to collect, record, and analyze information, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectrosopes, timing devices, and other equipment as needed to teach the curriculum</p>
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Objectives
<p>SWBAT <b>determine</b> ways that a battery, bulb, and wire can be connected that result in the bulb lighting.</p>
<p>SWBAT <b>differentiate</b> between open and closed circuits</p>
<p>SWBAT <b>utilize</b> symbols to diagram two ways that the system works, and two ways that the system does not work.</p>
<p>SWBAT <b>apply</b> their knowledge of traditional circuits (containing batteries) to the construction of circuits containing alternative forms of energy production.</p>

Lesson Plan	
<p><b>Engage</b></p>	<p>Students will light the energy ball. This device is activated when the circuit between two metal plates on the surface is completed by a human or other conducting material. This device does not produce any electrical shock, either major or minor.</p> <p>Students will try to use all group members to light the energy ball.</p>
<p><b>Explore</b></p>	<p>Make a mini bulb light using a battery and a piece of wire.</p>

	<p>Draw possible arrangements which successfully light the bulb including some form of symbols representing the power source, the wires, and the bulb. These will be drawn in the R&amp;D notebooks.</p>
<b>Explain</b>	<p>Students will present their findings on the board and answer questions as to why some of their arrangements worked and some did not.</p>
<b>Elaborate 1</b>	<p>Students will build circuits in series and in parallel and in series and apply an ammeter to the circuit.</p> <p>Students will investigate which circuit allows a higher overall current and decide which one will be the most preferable for use on a Martian settlement. As they make these decisions, they will defend their decisions to the instructor.</p>
<b>Elaborate 2</b>	<p>Students will be asked what other power sources could be used to power their light bulbs (solar, wind, thermo, biofuel, etc...). Students will be asked the advantages and disadvantages of each.</p> <p>Students will then brainstorm in their R&amp;D groups which form of energy they will want to use for their settlement.</p>
<b>Evaluate</b>	<p>Students will draw one arrangement which works to light a light bulb.</p> <p>Students will also decide which form of alternative energy (solar or wind) that they would like to use when constructing their settlement.</p>
<b>Closure</b>	<p>Students will be asked to recall the alternative energy sources they discussed in the previous session.</p>

	Students will be asked about the limitations and problems associated with each one.
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