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| **Lesson Title** | Blinky Bugs |
| **Length of Lesson** | 1 day (50 minutes) |
| **Created By** | Hannah Brackin |
| **Subject** | Physical Science |
| **Grade Level** | 8th |
| **State Standards** | Eighth Grade: 2d |
| **DOK Level** | DOK 2 |
| **DOK Application** | Construct, modify, distinguish, relate, classify |
| **National Standards** | 5-8: B: Energy Transfer |
| **Graduate Research Element** | In this lesson we track electron movement through circuits and in my research I study how electrons move through chemical systems. |

**Student Learning Goal:**

State Standards Eighth Grade:
2d: Relate how electrical energy transfers through electric circuits, generators, and power grids, including the importance of contributions from Mississippi companies. (DOK 2)

National Standards 5-8: B: Energy Transfer:
Electrical circuits provide a means of transferring electrical energy when heat, light, sound, and chemical changes are produced.

**Materials Needed (supplies, hand-outs, resources):**

Circuits power point, LED lights, lithium batteries, tape, pipe cleaners, piano wire, pickles, something to provide electrical current through the pickle (see teacher's notes for information on materials)

**Lesson Performance Task/Assessment:**

The students will be asked to construct a simply parallel circuit.

Students will be put into groups and asked to research local companies and each group will have to research and prepare a presentation to give to the rest of the class.

**Lesson Relevance to Performance Task and Students:**

Students will learn the basics of circuits and how they work. They will demonstrate their understanding of circuits by constructing a simple circuit. Finally, they will discuss and research examples of circuits in their everyday lives.

**Anticipatory Set/Capture Interest:**

Glowing pickle (Teacher's Notes)

**Guided Practice:**

The teacher will go through the power point and ask students the checks for understanding questions. If the students seem to struggle with the concept, take a moment to explain how a light bulb works. Draw a picture and ask them questions such as "what happens to a light bulb when it goes bad?" and "What does that mean happens to the flow of electrons?". Once the students show an understanding of circuits, lead them as a class through the construction of their blinky bugs using the pictures in the power point.

Finally, when they have completed their bugs, assign groups of students local companies to research and present about.

**Independent Practice:**

The students will be given the materials needed to construct a circuit in a ziplock bag. Following directions given to them as a class and pictures to help guide them, they will construct a simple circuit.

**Remediation and/or Enrichment:**

Remediation: Individual IEP. Have students construct the circuit as a group of 2-3.

Enrichment: Have students follow the more complex instructions found on the website.

**Check(s) for Understanding:**

Can you think of an example of series circuits? How do you know? Christmas lights-If one goes out on the string, they all go out.

Can you think of an example of parallel circuits? How do you know? The lights in the class room-when one light goes out the whole school does not lose lighting.

**Closure:**

Students will use their own hands to construct a circuit and will learn that circuits are a part of their everyday life on many different levels.

**Possible Alternate Subject Integrations:**

Physics: Review of simple circuits

**Teacher Notes:**

Glowing pickle demonstration: http://myglowingpickle.com/

Blinky bug supplies:

Batteries (3V) (2 for $1.75)
http://www.manventureoutpost.com/products/Energizer-2032BP%252d2-Lithium-Coin-%232032-3Volt-(2%252dpack).html?google=1

LEDs (max. 3V—This is a requirement) (25 for $6.00)
Amazon: http://www.amazon.com/Joe -Knows-Electronics-Clear-Pack/dp/B003N3W6DU/ref=pd_bxgy_e_img_c

Suntek: (20 for $4.56)
http://gb.suntekstore.com/20pcs-10mm-Red-Emitting-Diode-Light-Bright-LED.html?&utm_source=gbus&utm_campaign=gbus

Music Wire (3746 ft for $12.94)
http://www.waresdirect.com/products/Commercial-Products/Precision-Brand/Music-Wires243448?trackURL=froogle
The other things you will need:

1) scotch tape (clear not cloudy)
2) Glue dots to attach legs (walmart)
3) Pipe cleaners for the legs

Blinky Bug Website:
www.blinkybugs.com

For a blinky bug kit:
http://www.makershed.com/Blinkybug_Kit_p/9780811871402.htm?1=1&cart ID=0