Paper Circuits & Soft Circuits

Use *An Alarming Idea: Designing Alarm Circuits* from the **Engineering is Elementary** curriculum (developed by the Museum of Science, Boston) to teach students how electrical circuits work. This unit will get students thinking like electrical engineers. The hands-on activities in this unit reinforce science concepts including conductors and insulators, schematic diagrams, and circuits. For the final engineering design challenge, students, plan, create, and improve their own alarm circuit. (https://goo.gl/67GkLR)

Project Goals:

Students will extend their knowledge of conductors, insulators, and circuits by creating paper circuit cards and create a soft circuit by using electrical thread to connect a light and a battery. Students will share projects with class. Feedback will be given by peers. Students will also share projects on Seesaw.

Connection to NGSS:

PS3.B. Conservation of Energy and Energy Transfer

- Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy (4-PS3-2), (4-PS3-4)

Connection to ELA Common Core Standards:

- Conduct short research projects that build knowledge through investigation of different aspects of a topic. (W.4.7)

Materials Needed:

- Cardstock or construction paper
- 3V coin cell batteries

- Copper tape
- Clear tape
- LED Diodes (multiple sizes & colors)
- Markers
- Felt
- Battery holder
- Conductive thread
- Hot glue
- Sewing needles
- Fabric scissors

Steps for Paper Circuits:

- https://goo.gl/RKNLXx

Steps for Soft Circuits:

- https://goo.gl/5YNFDb

Self-reflection:

- What worked?
- What needs to be improved?
- How will improvements be measured?

Paper circuit lesson ~ December 2016