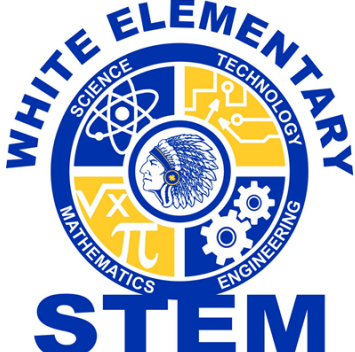


Lesson Title: Circuits and Electricity	Grade Level: 5	
Essential Question: How do different elements work together for a common purpose?		

Standards:

Science Standards:
S5P2. Obtain, evaluate, and communicate information to investigate electricity.

- Obtain and combine information from multiple sources to explain the difference between naturally occurring electricity (static) and human-harnessed electricity.
- Design a complete, simple electric circuit, and explain all necessary components.
- Investigate and test common materials to determine if they are insulators or conductors of electricity.

Math Standards:
MGSE5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Other Content Standards:
ELAGSE5W3: Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
ELAGSE5RL6: Describe how a narrator’s or speaker’s point of view influences how events are described.
ELAGSE5SL5: Include multimedia components and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Technology Integration: Language Arts—Minecraft: Education Edition Science—Legends of Learning	Career Connection: Electrical engineer, electrician, line installers and repairers, construction managers, power plant operators, power plant distributors, power plant dispatchers, electronics engineer, electronics installers and repairers, electronics drafter, electronics technician, animators, authors
Engineering Challenge: Design a complete circuit that will light a light bulb	Materials: Batteries, light bulbs, led diodes, Christmas tree lights, battery holders, light bulb holders, wire, alligator clips, aluminum foil, popsicle sticks, playdough, rubber bands, pencil lead, coins, paper, laptops, STEM journals

Lesson Procedures

Day 1-Introduce static electricity with Flying Tinsel video. How do objects become electrically charged? Predict what other materials would become electrically charged in the same way the tinsel became charged.

Day 2-<https://www.exploratorium.edu/snacks/remote-control-roller> What force did you use to move your can: attract or repel? Explain how you used that force.

Day 3-Pretend that the lights have gone off at home. All you have is a battery, wire, and lightbulb. Draw a model of how you could use these items to make light. Give examples of models and have student predict which would work. Allow students to test the different models to see which one works. Explain the components need to light the light bulb.

Day 4 and 5-Model 2 light bulbs in a series and in a parallel circuit. Predict: How will the brightness of a single lightbulb compare to the brightness of lightbulbs in a series or lightbulbs in parallel? Allow students to test the models. Are there rules about how electricity flows through different arrangements of light bulbs? Students will read “*Jake Drake Know It All*” and discuss/record in STEM journal how Jake used the engineering process to create his electromagnet project.

Day 6-Have students build a series circuit with 2 bulbs. Remove one bulb. What happens? Build a parallel circuit with 2 bulbs. Remove a bulb. What happens? Define open and closed circuit. Students will begin writing a narrative essay from the point of view of a circuit searching for his two remaining parts to make him/her whole (power source/load/conductor).

Day 7-Have students test materials in their circuits to determine if they are insulators or conductors.

Day 8- Study Jam "[Electricity](#)" Have students compare and contrast static electricity (naturally occurring) examples with current electricity (human harnessed) examples.

Day 9-Students design their circuit and determine the amount of money they will spend to build it.

Day 10-Build circuits, evaluate, and redesign as desired. If ready, students will begin designing their two settings that depict finding their missing parts from their narratives using Minecraft Education Edition.

Day 11-Build redesigned circuit. Present to classmates. Students will design two settings that depict finding their missing parts from their narrative using Minecraft Education Edition.