Lions Light and Transfer of Energy Using Electricity

Grade/Grade Band:	**Topic:** electricity	**Lesson Title:** Squishy Circuits
Brief Lesson Description: In this lesson we explore transfer of energy using electricity using the book Lion's Light and Squishy Circuits		
NGSS Performance Expectations: Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. 4-PS3-2 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. 4-PS3-4		
Specific Learning Outcomes: Build circuits using Playdough, batteries, buzzers, LEDs wires		
Prior Student Knowledge:		
Science & Engineering Practices: **Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution** **Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.** **Evaluate appropriate methods and/or tools for collecting data.**	**Disciplinary Core Ideas:** 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.	**Crosscutting Concepts:** Energy can be transferred in various ways and between objects
Possible Preconceptions/Misconceptions: Students may think of energy as: • having "human-like" characteristics [The thinking might include energy being connected to food, and health] • found only in fuels. Only as stationary--sitting and waiting to be found and used		
Words We Will Learn and Words We Will Earn (OpenSciED) Just in time words…		
Phenomena		
Materials to spark curiosity : energy sticks **Materials to be used in building the circuits (investigative phenomena)** **Conductive dough (dough that will allow electricity to move through it)**		

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Battery back 4 AA LEDs Motor Buzzer Alligator clips
Text Used to Support 4-PS3-4 **" Lion Lights "**
Supplemental Materials to spark curiosity : Energy sticks

Learning Plan

Notice and Wonder -What do you notice and wonder about the materials provided?
Materials
Read once just so students hear the story …
Second reading Interactive read aloud Lions Lights
At the end the story of Lion's Lights and ask students how they could use the materials provided to ward off the lions?

Similar Phenomena -
How are the lights in the story similar to ? Where else have we seen lights, heard noises when thinking about energy moving using electricity?

Asking Questions
Thinking about our previous work doing investigations about electricity ,our observations, the story, similar phenomena and our materials …what questions do you have about using these materials to move energy ?

Draw a model (design) of what you might build to keep the lions away

Engineer / build their solutions to keeping the lions away …but how are going to know if it works

Success Criteria: Demonstration that they have built a closed circuit by having evidence of sound and light

Science Circle: Sharing , describing your solution and explaining how it works

Use Text for Additional Evidence : Research and find a piece of nonfiction text as additional evidence about how circuits work

Constructing Explanations
In our designs what had to happen for the electricity to move through the model and light up and make a sound?

Sentence frames : In order for our model to light up an/or make noise the circuit had to be _____.
This means that we need to close our circuits by _____.

Connections: How do our "squishy circuits" help us explain the energy stick ? What did we find out today

? How might our squishy circuits keep the lions away

Today I _____. This helps me better understand how the energy works _____.

Lesson Idea

Connecting with Lion Lights

Ted talk