

6<sup>th</sup> grade Energy  
**2017 Science P.L.U.S. Institute**  
 Roper Mountain Science Center  
 Greenville, South Carolina

**Academic Course Description:**

Hands-on, inquiry-based activities emphasizing science process skills will provide the vehicles for studying concepts that correlate to the South Carolina Science Academic Standards for sixth grade physical science (energy transfer and conservation). Course topics are designed to enhance the middle school teacher's physical science knowledge base and provide appropriate lessons for the 6th grade science classroom. Activities are aimed at developing awareness in students of the basic processes of energy transfer and conservation, including knowledge of conceptual understanding, performance indicators, science and engineering practices, and crosscutting concepts. The use of developing models in the science classroom will be represented at Roper Mountain Science Center through the 6<sup>th</sup> grade STEM lab field trips opportunities. Participants receive a significant quantity of science materials for performing the activities in their classrooms.

**Outline of Course Content:**

Topics	Activities or Assignments	Correlation to SC Science Standards
Different Forms of Energy	Energy Transformation Lab, and Sorting Activity (providing evidence)	6.P.3A.1 Analyze and interpret data to describe the properties and compare sources of different forms of energy (including mechanical, electrical, chemical, radiant, and thermal).
Gravitational and Elastic Energy	Design a Roller Coaster Lab Marshmallow Catapults Comeback (Obedient Can)	6.P.3A.2 Develop and use models to exemplify the conservation of energy as it is transformed from kinetic to potential (gravitational and elastic) and vice versa.
Energy Transformation in Electric Circuits	Snaps Circuits Lab, Paper Circuit Card	6.P.3A.3 Construct explanations for how energy is conserved as it is transferred and transformed in electrical circuits.
Models of Magnetic Fields and Electrical Energy	Build a Simple Motor Hand Generator Build a Generator Build an Electromagnet	6.P.3A.4 Develop and use models to exemplify how magnetic fields produced by electrical energy flow in a circuit is interrelated in electromagnets, generators, and simple electrical motors.
Models of Heat Transfer	Melting Blocks Lab Convection Currents Lab Demonstration of Leslie's Cube Demonstration using rheoscopic fluid	6.P.3A.5 Develop and use models to describe and compare the directional transfer of heat through convection, radiation, and conduction.
Design Devices that Minimize or Maximize Heat Transfer	Warm and Cool Things Lab Save the Penguins Project	6.P.3A.6 Design and test devices that minimize or maximize heat transfer by conduction, convection, or radiation.
Simple and Complex Machines	Online simulations/Rube Goldberg Machine Simple Machine Mini Lab with Ramps	6.P.3B. Conceptual Understanding: Energy transfer occurs when two objects interact thereby exerting force on each other. It is the property of an object or a system that

		enables it to do work (force moving an object over a distance). Machines are governed by this application of energy, work, and conservation of energy.
--	--	--