Roper Mountain Science Center

Pre-Visit/Post-Visit Guide ***<u>Lesson Name</u>: Power to Survive***

<u>Summary of Lesson</u>:

EQ: How can we transform energy to help us if the power goes out?

The power is out; communications are down: How will you survive? In this three-part STEM lab, students will engage in hands-on learning to explore energy transformations and conservation of energy. Can wind energy supply the electricity needs? Is solar energy an option? Student teams will analyze data, solve problems, and then design and create solutions for survival through exploring generators, electromagnets and circuits. The interactive labs will include real-time solar energy production. Do your students have what it takes to survive?

<u>South Carolina Science Standards-</u> Science Standards: 6.P.3.A.1; 6.P.3A.3; 6.P.3A.4; 6.S.1A.2; 6.S.1A.4; 6.S.1A.6

Pre-Visit Resources

- <u>Teacher/Chaperone Expectations</u>: Please help us by letting us know of any special accommodations for your students prior to the lesson. During the labs, students will be working in teams of 3, each with a different "engineering" role. However, adjustments on team size will be made as needed. Safety is a top concern, students will be asked to keep longer hair tied back and tuck in loose clothing and badges. Your assistance with classroom management and distribution of lesson materials will also be greatly appreciated.
- <u>Key Vocabulary</u>: Forms of energy (mechanical, electrical, radiant), transformation of energy, conservation of energy, generator, motor, solar cell, circuit, conductor, insulator, load, series and parallel circuits.
- <u>Key Questions Addressed in Lesson</u>: How do we transform radiant or mechanical energy into other forms of electricity? How do we analyze data to select a wind turbine blade design? What are some advantages and disadvantages of the different ways to generate electricity?
- <u>Content Preview Video – Renewable Energies</u>: https://www.youtube.com/watch?v=RnvCbquYeIM

Post-Visit Resources

- <u>Writing Prompt</u>: What if an Electromagnetic Pulse (EMP) actually occurred? Research- What could actually cause an EMP that would affect our daily lives on earth? Describe the steps you would take to successfully survive if there was no power.
- <u>Possible Lesson Link</u>: https://www.teachengineering.org/lessons/view/ucd_energy_lesson03
- <u>Video Link—How Batteries Work:</u> https://www.youtube.com/watch?v=9OVtk6G2TnQ