Lesson 9: Power Systems 1
Lesson 10: Power Systems 2
Lesson 11: Power Systems 3

Materials

Articles

Power Systems

- Energy Supply Problem
- Rechargeable Batteries
- All About Power
- Emergency Procedure
- Create Your Own Electrical Circuit (Or something like that)

Directions and materials for explorations (Lesson 11):

1. Electrical Current Creates a Magnetic Field
2. The Electrical Circuit: A Quick Guide
3. Nailing Down Energy
4. A Shocking Discovery
5. Electrolysis

It's Electric

Storyline

A continuous supply of electricity is critical on board the space station.
It is important for maintaining the life support, communications, and navigation systems.
Electrical systems on board the space station are particularly susceptible to extreme solar weather.

Main Topics

Space station power systems follow the same principals as earth-bound electrical systems.
Solar cells and rechargeable batteries provide the electricity on the space station.
The space station's orbit around the earth requires that two sources of energy be available.
Electrical systems on the space station are vulnerable to extreme solar weather.
Electricity and magnetism are closely related in a number of ways.

Outcomes

- The students will be able to identify the main elements of a circuit.
- The students will be able to identify two sources of electrical power on the space station: photovoltaic cells and rechargeable batteries.
- The students will be able to describe a basic circuit and explain the terms "watts" and "electromotive force."
- The students will be able to explain some of the uses of electricity on the space station.
- The students will be able to compare and contrast the circuits on the space station and those in their homes.

Materials Preparation

Gather and prepare all materials for electrical experiments, Lessons 10-11.

Copy all articles and materials needed for Life Support Systems (Unit 5) and Pre-Mission Preparation (Unit 6)

Vocabulary

Unit 4 Overview: Power Systems

Teaching Approaches

Power Quizzes are excellent ways to review materials and motivate your students. Divide the class in half and have two teams compete, or have entire class compete against you.
Use student groups to explore and report on all of the electrical explorations. Assign one group to each of 6 experiments. Have groups report on findings, observations, procedures (if any) and application to space station.

Connections to Other Units

Internet Resources:

Recommended search engines:
http://vivisimo.com
http://www.google.com
http://www.kartoo.com

Valuable Search Terms and Phrases:
"electricity basics," (Quotes have been used here to delineate terms. Do not use quotes when typing in a search term or phrase.)

Sites:
http://spacelink.msfc.nasa.gov/
(The above is the "hub" site for all NASA's online educational materials.)

Looking Ahead:

This unit emphasizes the practical aspects of electricity as related to the e-Mission itself.