

OPERATION: INFINITE POTENTIAL

Restructuring the Energy Portfolio

Researchers



Dr. Janet Green
Space Weather
Physicist, NOAA



Dr. Vasily V. Titov
Director, NOAA Center
for Tsunami Research



Dr. Larry Shadle
Model Validation
Research Group Leader,
National Energy
Technology Laboratory



Dr. Martin Keller
Director, BioEnergy
Science Center,
Oak Ridge National
Laboratory



Constance Adams
National Geographic
Emerging Explorer,
Space Architect

Mission Overview

Mission 1:
Critical Current – Defining Energy

Explore energy in its many forms.

Mission 2:
Waves of Change – Calculating Transfers and Transformations

Understand how energy is transferred and transformed in predictable ways.

Mission 3:
Power to the People – The Current State of the Grid

Investigate how we currently meet our energy and power needs.

Mission 4:
Energy Independence – The Quest for Sustainable Resources

Evaluate the future role of alternative energy resources.

Mission 5:
Energy Security – Powering our Future

Create a blueprint for a secure energy future.

National Science Education Standards Alignment

- B.3.a** Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical.
- B.3.b** Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature.
- B.3.c** Light interacts with matter by transmission (including refraction), absorption, or scattering (including reflection).
- B.3.e** In most chemical and nuclear reactions, energy is transferred into or out of a system.
- B.3.f** The Sun is the major source of energy for changes on the Earth's surface; the Sun's energy arrives as light with a range of wavelengths, consisting of visible light, infrared, and ultraviolet radiation.

- B.3.a** See above
- B.3.b** See above
- B.3.d** Electrical circuits provide a means of transferring electrical energy when heat, light, sound, and chemical changes are produced.
- B.3.e** See above
- B.3.f** See above

- B.3.a** See above
- B.3.b** See above
- B.3.d** See above
- B.3.e** See above
- F.2.b** Causes of environmental degradation and resource depletion vary from region to region and from country to country.

- B.3.a** See above, **B.3.e** See above, **B.3.f** See above
- E.2.d** Perfectly designed solutions do not exist. All technological solutions have trade-offs, such as safety, cost, efficiency, and appearance.
- F.2.b** See above
- F.4.a** Risk analysis considers the type of hazard and estimates the number of people that might be exposed and the number likely to suffer consequences.
- F.4.b** Students should understand the risks associated with natural, chemical, biological, social, and personal hazards.
- F.4.c:** Individuals can use a systematic approach to thinking critically about risks and benefits.

- B.3.b** See above
- E.1.a** Identify appropriate problems for technological design.
- E.1.b** Design a solution or product.
- F.1.g** Natural environments may contain substances (for example, radon and lead) that are harmful to human beings.
- F.2.b** See above