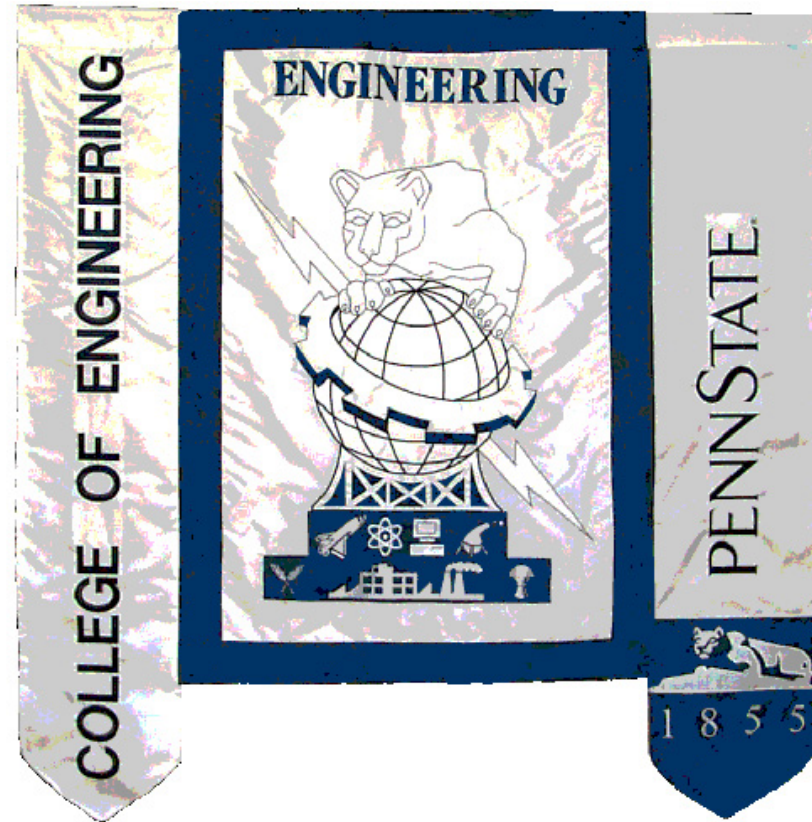


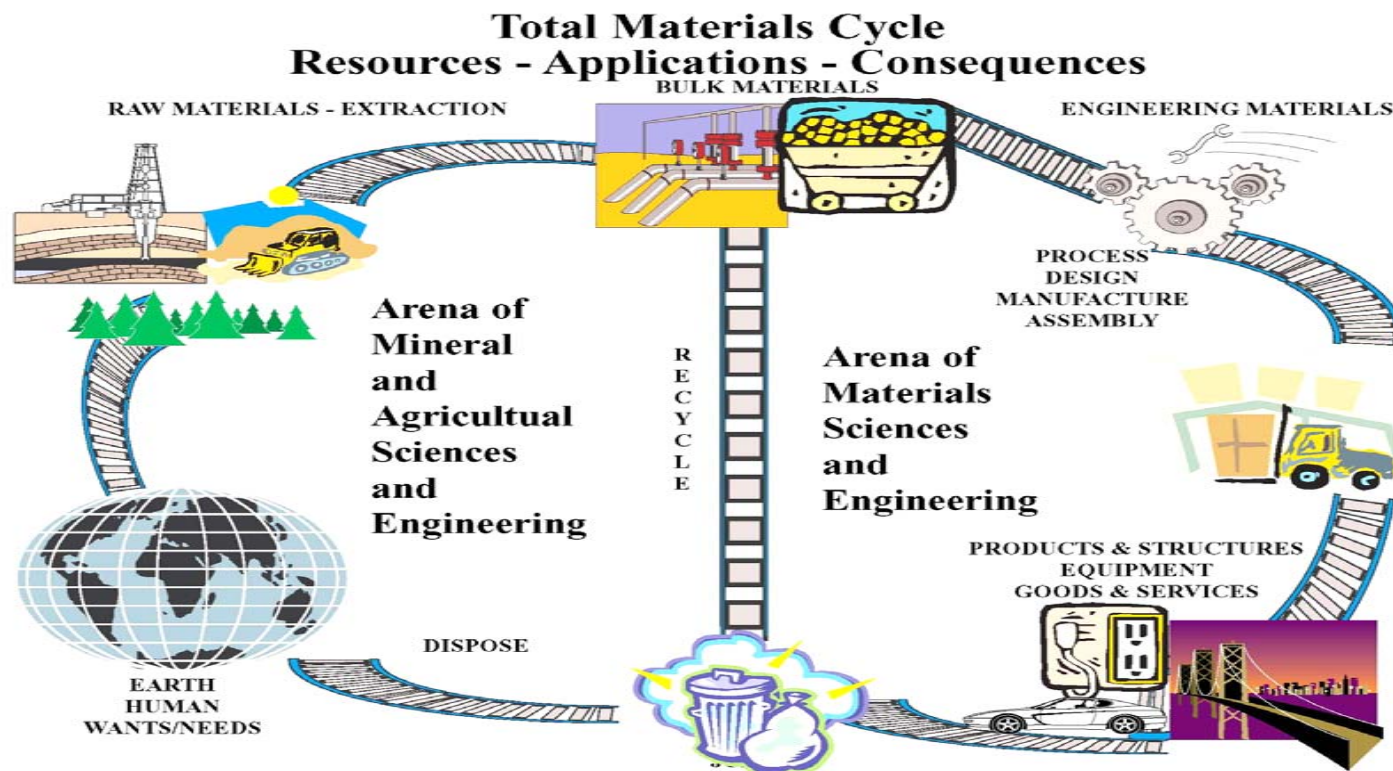
Using energy more effectively toward a more balanced ecological system in the future



Governor's Institute for
Teachers on the Environment
and Ecology

Presenters:
John R. Vincenti
Guy E. Anderson

Energy use impacts > Air – Water – Land
Human Sectors:
Government – Industry – Medicine - Academia - Research
Manufacturing – Business - Residential



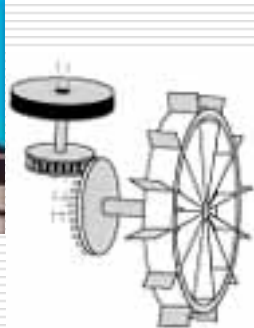
Penn State program development

- Renewable Energy and Conservation Education
 - Youth Energy and Science Camps
 - Young Engineers and Scientists Workshop
 - Extend-A-Day Energy grants and K-12 pilot programs
 - Handbook [hard copy and CD]
 - Supports PA Academic Standards
-

Five Key Areas of Study #1

□ Energy

- Understanding the basics of potential and kinetic energy and the various types including heat, light, gravity, mechanical, chemical, atomic, and electrical energy



Energy Topics and Subjects

<ul style="list-style-type: none">• Air systems• Bio-mass• Clean-coal technology• Cogeneration• Efficiencies• Electricity production and distribution• Fuel cells• Geo-thermal• Green building	<ul style="list-style-type: none">• Insulation• Lighting• Hydroelectric low & high head• Mass transportation• Motor efficiencies• Natural gas• Nuclear fission and fusion• Ocean technology• Oil• Product manufacturing	<ul style="list-style-type: none">• Recycling• Recovery• Renewable• Sustainable• Solar passive and active• Space travel• Synthetic fuels• Vehicle design• Water• Wind• Wood
--	--	---

Five Key Areas of Study #2

□ Risk/Toxicity

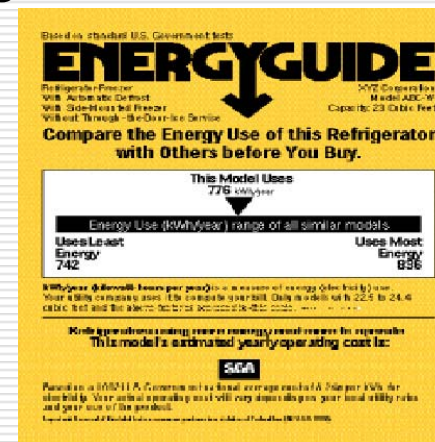
- Understanding that all energy forms have a certain degree of risk or hazard related to poison or other related danger



Five Key Areas of Study #3

□ Conservation

- Understanding that the only way to improve energy use is to not only conserve it, but also improve the way we develop and apply energy uses



Five Key Areas of Study #4

□ Ecology

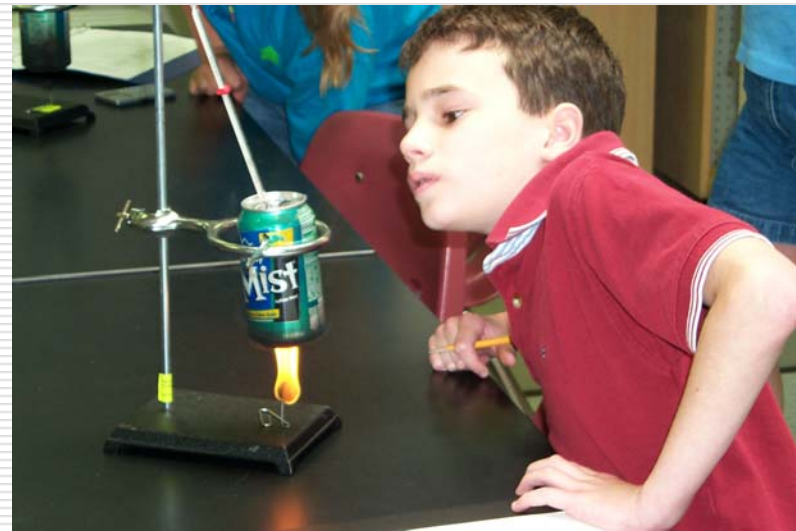
- Understanding that daily, humans impact our environment—our water-air-land including the biosphere and its inhabitants



Five Key Areas of Study #5

□ Competition

- Understanding and encouraging individual and group work, study, and achievement



Middle School areas of study

Conversions . Consumption . Resources . Generation

- Concept map
 - Calorimetric measurements
 - Consumption and consumer awareness – Appliance survey
 - Appliance energy use: How much does it cost?
 - Electricity: The basics
 - Electric power and metering: Measuring electrical current
 - Engineering and Economics
 - Finding fossils fuels
 - Electricity: Lighting efficiency – Operating cost and savings
 - Electricity generation: How does a Potato Clock work?
 - Recycling
 - Insulation
 - Efficiencies
 - Lighting survey with meters
 - Mini-generators
 - Fuel cells
 - Solar cells
-

High School areas of study

- Electricity basics
 - Watts up meter
 - Electroplating
 - How to read a resistor
 - Introduction to radiation
 - Counting statistics
 - Radiation shield
 - Thickness gauging
 - Microdensity of plastic
 - Polymers in our daily lives
 - Polystyrene
 - Testing sunscreens
-

2004

Extend-A-Day Energy Grants



- ❑ [Bald Eagle School District](#) - Steve Rulon and Gary Spotts
[Cambria Heights School District](#) - Carol Thomas and
Bobbie Jean Cammarata
 - ❑ [Conrad Weiser School District](#) - Cindy Murdough
 - ❑ [Coudersport Area School District](#) - Carl Klingaman
 - ❑ [Fleetwood Area School District](#) - Jerry Oyler
 - ❑ [Millcreek Township School District](#) - Jason Buto
 - ❑ [St. Peter's School, Reading, PA](#) - Megan Sulecki
 - ❑ [South Butler County School District](#) - Jackie Pfeiffer & Team
 - ❑ [Tulpehocken Area Schools](#) - Terry Laughlin
 - ❑ [Tyrone Area School District](#) - David Loth and Glenna Emel
 - ❑ [West Chester Area School District](#) - Nancy Krablin
 - ❑ [Westmont Hilltop School District](#)- Barbara Miltenberger and
Sheryl Treece
-



Today's students, Tomorrow's leaders

