

Inquiry Based Physical Science

EDUC 5301

Summer, 2008

Overview of the Summer Institute:

The 2008 Summer Institute will focus upon physical science, specifically energy. During the Summer Institute, participants will learn concepts related to forms of energy and the transfer of energy through hands-on explorations, presentations of related content by experts, and cooperative learning energy research projects. The NJCCCS and NAEP 2009 Frameworks are aligned to the projects. Math and Technology will be integrated through the energy explorations and projects. Connections from content to classroom learning will be developed by the participants.

Essential Questions:

How do we know that things have energy?

How can energy be transferred from one material to another?

What happens to a material when energy is transferred to it?

What happens to the energy in a system — where does this energy come from, how is it changed within the system, and where does it ultimately go?

How does the flow of energy affect the materials in the system?

What is a “responsible” use of energy?

Are there alternative forms of energy that will serve our needs, or better ways of using traditional forms of energy?

Your final grade will be based upon the following assignments:

Assignments:

Energy Labs:

Participation in all energy labs is essential to the success of the summer institute. Each participant will receive acknowledgment of their participation in individual labs.

International Usage Energy Research Project:

Participants will complete a cooperative learning project on energy usage in our world. They will investigate the energy usage, sources, costs, plans, consequences of a particular place in the world and they present their findings to the whole group.

- Research your assigned country.
- Find the energy usage of the country.
- Find their main sources of energy.
- Provide the positives and negatives of the energy source.

The International Usage Energy Research Project will be due on Thursday, August 6th.

House Energy Project:

The goal of the project is to provide opportunities for participants to apply what they have learned about energy forms, energy transfer, and usage to develop an ideal energy efficient home powered by a renewable energy source.

- Conduct an energy audit on your own home.
- Consider energy conservation methods.
- Develop a plan for an energy efficient home with a renewable energy source.
- Provide a strong rationale for the chosen energy source.
- Build a model of an energy efficient home.

The House Energy Project will be due on Friday, August 15, 2008.

Reflections/Capstone Project:

The goals for this summer's institute include helping teachers to be better prepared to help their students develop enduring understandings of energy and its transformations. With that goal in mind all participants will design a unit plan based upon the following themes adapted from the 2009 NAEP framework:

- Forms of energy
- Energy transformations in living systems, natural physical systems, and artificial systems constructed by humans
- Energy source usage, including distribution, energy conversion, and energy costs and depletion

The Unit Plan will be due on Friday, August 15, 2008.

