THE ENERGY MOSAIC: HOW CAN WE MEET OUR FUTURE ENERGY NEEDS?

Grades 9–12

Students combine facts, statistics, and projections to create a mosaic of the current and future global and domestic energy picture. They generate solutions for how we can meet future energy needs and examine the benefits and trade-offs of those solutions. They then examine current energy use and sources in their state or community and draw conclusions about how local uses and sources impact the global energy picture, and how the global energy picture impacts local uses and sources.

Lesson Printable: Meeting Future Energy Needs

Objectives:

- Students will analyze global energy facts and statistics to help them answer the question, "How can we meet our future energy needs?"
- Students will research local energy uses and sources.
- Students will draw conclusions about how local uses and sources impact the global energy picture and vice versa.

Alignment with National Standards: Science, Technology, Engineering, Math

Skills: Research and investigation, synthesis, reasonable prediction, data interpretation and analysis, evaluation

MATERIALS

- Internet access
- Printable, "Meeting Future Energy Needs" (PDF), one per student
- Pieces of string
- Tape or pushpins

Time Required:

Introductory activity: 30–45 minutes
Research/Printable: 90 minutes (involves Internet research)
Presentation: 60 minutes

(cont.)

DIRECTIONS

Note: Before students enter the classroom, write the question, "How Can We Meet Our Future Energy Needs?" on the board and cut up "Energy Mosaic Cards" from Part 1 of the printable.

1. As students enter the room, ask them to read the question and spend a few minutes journaling any initial answers or ideas that come to mind. After a few minutes, direct them to pair up with another student and share answers. Call upon a few volunteers to present their ideas. Ask students what additional information they might need to more thoroughly answer this question.
2. Distribute one "Energy Mosaic Card" from the printable to each student pair. Direct student pairs to read their card and present answers to the following questions:
   - How does the fact on your card impact your life?
   - How does the fact on your card relate to future energy needs?
3. After each pair presents, ask them to tape or pin their card up on the board.
4. Give students a few minutes to go up to the board and review all cards. Have them consider how the facts on different cards relate to one another and how they can be combined to tell a story about the future energy picture. Distribute a piece of string to each student pair, and challenge them to use the string to connect two (or more) separate cards that they believe relate to each other. Have them share connections with the class.
5. Direct original student pairs to use information from the cards to expand their answer to the original question, "How can we meet our future energy needs?" Have each student pair present their expanded answers. Record the ideas on the board as students are presenting.
6. Categorize ideas into three groups: those that will expand or diversify energy sources, those that will create efficiencies, and those that will reduce pollution. Some ideas may be relevant to more than one group. Review ideas. Which do students think would have the greatest impact and fewest tradeoffs? Which seem most practical?
7. Now that students have looked at the global energy picture, ask them to share what they know about your town or state's energy picture. This could include existing energy sources, the types of energy available, potential for renewable energy, initiatives already under way to expand energy sources or create efficiencies, and other energy-related topics.
8. Direct students to Part 2 of the "Meeting Future Energy Needs" printable. Review the directions. Tell student groups that they are going to research the current and projected energy picture in their state or local community and draw conclusions about how local choices and sources impact the global picture and how the global picture impacts local choices and sources.
9. Give students ample time to conduct research. Direct them to your state's profile at the U.S. Energy Information Administration's "State Energy Profiles" website (listed in the resources section) and/or to the website for your local energy company to conduct their research.
10. Once student groups have completed the research, share answers.
11. Discuss these questions which are printed at the end of the student printable:
    - What concerns do you have about the local and global energy picture?
    - What opportunities are there to diversify sources or create efficiencies?
    - How do local energy choices impact the global energy situation?
    - How does the global energy situation impact local energy choices?

(cont.)

ADDITIONAL RESOURCES

"Energy Explained"
http://www.eia.gov/energyexplained/

This site, from the U.S. Energy Information Administration, contains independent statistical and analytical data on energy. Look for links to:

- state energy profiles
  http://www.eia.gov/state/
- a vast store of data on energy uses
  http://www.eia.gov/energyexplained/index.cfm?page=us_energy_use
- energy sources and their environmental impacts
  http://www.eia.gov/energyexplained/index.cfm?page=environment_home
- "Energy in Brief":
  http://www.eia.gov/energy_in_brief/
  Read about current and important energy topics explained in straightforward language.

Shell Alternative Energies Overview
Clear Roles. Clear Responsibilities. Clear Results. Speech by Marvin Odum.
Growing Cities. Growing Responsibility. Speech by Marvin Odum.
Meeting Our Future Energy Needs. Speech by Peter Voser.

Visit www.shell.us/energizeyourfuture to learn more about how alternative energy resources will help provide energy for the future..