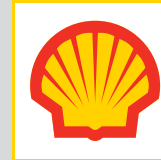


NATURAL GAS IN THE ENERGY MIX



Grades 9–12

In this lesson, students will learn about the benefits and trade-offs of natural gas and make recommendations for the role of natural gas in the energy mix over the next 50 years, based on a set of self-selected criteria. They then will create a commercial, video, website, or blog to educate consumers about the extent to which we should make natural gas part of our energy mix.

Lesson Printable: Natural Gas in the Mix

Objectives:

- Students will identify and prioritize criteria to help determine which energy sources should be part of our current and future energy mix.
- Students will conduct research to determine to what extent natural gas meets the criteria they've selected.
- Students will design a project to educate consumers about the role natural gas should play in the U.S. energy mix.

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

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

MATERIALS

- Internet access
- Printable, "Natural Gas in the Mix" (PDF), one per student
- Six signs, each with one of the following descriptions written on it: plentiful, cheap, cleaner-burning, easy to access, minimal environmental disruption, renewable
- Blank signs to be filled in during activity (as needed)

Time Required:

Introductory Activity: 15 minutes

Research : 60–90 minutes (involves Internet research)

Project Development: Up to one week

(cont.)

DIRECTIONS

Part One

Note: Before students enter the room, hang the six signs (see materials list) in different areas of the room.

1. Review with students what they know about the current and future global energy situation, including supply vs. demand, future population growth, reliance on foreign energy sources, the impact of global urbanization, and the environmental and economic impact of different energy sources. See "The Energy Mosaic" lesson (Please refer to Lesson 1 of 8 for the "Energy Mosaic" lesson) for facts and resources to help guide the discussion.
2. Pose the following scenario to students: Imagine that you work for the U.S. Department of Energy and have been asked to determine which energy sources the United States should invest in over the next 50 years. What criteria would you consider? Have students share initial thoughts.
3. Point out the six signs around the room. Compare these to the criteria students shared in Step 2 and switch out or add new criteria as appropriate. Direct students to write down each of these criteria (and any additional criteria they would include) on a sheet of paper. Then ask students to prioritize each of the criteria, based upon how important it would be to them when selecting energy sources. For example, if they think that an abundant supply of the energy source is most important, they would rank "plentiful" as #1. Give students a few minutes to complete their rankings.
4. Direct students to physically move to the sign that lists the criterion they ranked as most important (#1). Hopefully there will be a fairly even distribution among several signs. Ask students to discuss within each group at their sign why they believe the criterion they selected is most important. After five minutes, ask each group to share their justification. Note that there is not one correct answer so you will want to encourage spirited dialogue!
5. Challenge students to list as many energy sources as they can on the board. Ask students if they think that any energy source on the list meets all of the criteria they've selected. Which energy sources come closest to meeting all of the criteria? Do they know how many criteria natural gas meets?
6. Tell students to refer back to the ranking of priorities they outlined earlier in the lesson. Give them the option of changing their order. Distribute the "Natural Gas in the Mix" printable. The printable asks students to select their top three criteria for which energy source they'd like the United States to invest in. It then asks them to conduct research to determine whether natural gas meets those criteria.
7. Give students ample time to conduct research at the websites listed in the "Additional Resources" section, or using alternative resources.
8. Once students have completed their research, have them come back together and compare answers. Review each criterion and discuss:
 - Which criteria does natural gas meet?
 - Which criteria does natural gas not meet?
 - Based on what you learned, what role do you think natural gas should play in the U.S. energy mix over the next 50 years: major, moderate or minor?

Part Two

9. Now that students have decided what role natural gas will play in our energy mix, their next step is to educate American consumers about why.
10. Review Part 2 of the printable with students. The assignment asks them to create a project that communicates to American consumers what role natural gas should play in our energy mix over the next 50 years. Their project must include the following:
 - Background information about natural gas (what it is, how it is formed, how it is captured, and what percentage of the current U.S. energy mix is from natural gas)

(cont.)

- Specific information about the role natural gas should play in our future energy mix based on the top three criteria they selected.
 - They can select a blog, website, commercial, YouTube video, or brochure for their project. Or they can choose another creative medium.
- 11.** Have students present finished projects to the rest of the class and draw conclusions about the role of natural gas in our country's future.

ADDITIONAL RESOURCES

- American Petroleum Institute: Adventures in Energy
<http://www.adventuresinenergy.org/>
- NaturalGas.org
www.naturalgas.org
- Shell Oil: Natural Gas
http://www.shell.com/home/content/innovation/meeting_demand/natural_gas/
- U.S. Department of Energy – Natural Gas
<http://energy.gov/natural-gas>
- U.S. Energy Information Administration: Natural Gas Explained
http://www.eia.gov/energyexplained/index.cfm?page=natural_gas_home

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

© 2012 Shell Oil Company.