

ENERGY

Teacher Lesson Plan

LEVEL

Grades 4-5

SUBJECTS

Language Arts
Math
Science
Social Studies
Visual Arts

CONCEPTS

People use ingenuity and innovation to make the best use of available resources.

To sustain the availability and use of important resources, people practice conservation.

Human consumption patterns affect the availability of resources. To meet the needs of an expanding human population, societies practice resource management and employ technology.

SKILLS

Analyzing
Categorizing
Classifying
Comparing
Contrasting
Data Gathering
Discussing
Interpreting
Organizing Information
Representing
Researching

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In addition to providing beauty and recreation, forests supply raw materials to help meet society's needs for housing, paper, containers and thousands of other products used by consumers every day. As one of the country's leading forest products providers, Georgia-Pacific LLC has a long-term interest in and commitment to the health of our nation's forests.

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OVERVIEW

When you turn on the television, tie your shoelace or drive to the store – you're using energy. Energy is everywhere in nature – in the light of the sun, in wind, in falling water and erupting volcanoes. Without energy, there is no life.

DISCUSSION, STUDY TOPICS AND SUGGESTED ACTIVITIES

The study of energy can be used in the context of many different areas of learning. Here are some suggestions:

SCIENCE

- **Resources.** Energy is produced from a variety of different resources. What is the difference between a renewable and a non-renewable resource? What are some examples of each? What kind of resources are used to generate energy at your school, in your community? Are they renewable or non-renewable? (*research project, class activity, class presentation*)
- **Energy generation.** What are the by-products of producing energy from different resources? What happens to these by-products? How do these by-products affect the cost of energy generation? (*research project, class presentation, class experiment*)

MATH

- **Economics.** What are the costs involved in generating energy? Are some forms of energy more expensive than others? Why? Create a lesson teaching students how to read the electric meter at their own home. (*Check with local provider for this information.*) Have students monitor their electric meters at home to measure energy use. Using their family's electricity bill, have students calculate the cost of a day's worth of energy. Are there ways to conserve energy at home? (*research project, class activity, essay topic*)
- **Activity Suggestions.**
 1. If a car needs 5 gallons of gas to go 125 miles, how many gallons of gas would a car need to go 225 miles? 50 miles?
 2. Look at the pie chart (circle) inside your energy folder. It shows that natural gas is 25% of the world's most heavily used commercial energy source. Convert (change) 25% to a fraction.
 3. If one power plant can produce energy for 100,000 homes, how many power plants would be needed to produce, power for one million (1,000,000) homes?

SOCIAL STUDIES

- **Then and now.** How have people generated energy/power throughout history? How have attitudes toward energy/power generation changed over time? Have students interview their parents and grandparents to find out whether or not things have changed. (*research project, essay topic, class presentation*)
- **Energy around the world.** Do different parts of the world use different energy sources? Why? Have student groups research particular regions, countries or cultures to determine energy sources and uses. (*research project, art project, class presentation, class discussion*)

LANGUAGE ARTS

- **Alternative energy.** How do you use energy every day? How would you accomplish the same tasks if you lived 200 years ago? (*essay topic, short story, play, video project*)
- **Vocabulary Activity Suggestions.**

Vocabulary Words: static electricity, potential energy, kinetic energy, hydro power, fossil fuels, nuclear energy, solar energy, biomass

 1. Choose one of the energy related words above. Research how one of these forms of energy affects our everyday life. Draw an illustration of how we might use this form of energy in the future.
 2. Write a short story about how we could use one of the forms of energy listed above to power a portable homework machine, a robotic room cleaning machine, or choose another machine that would be useful to us.

ENERGY

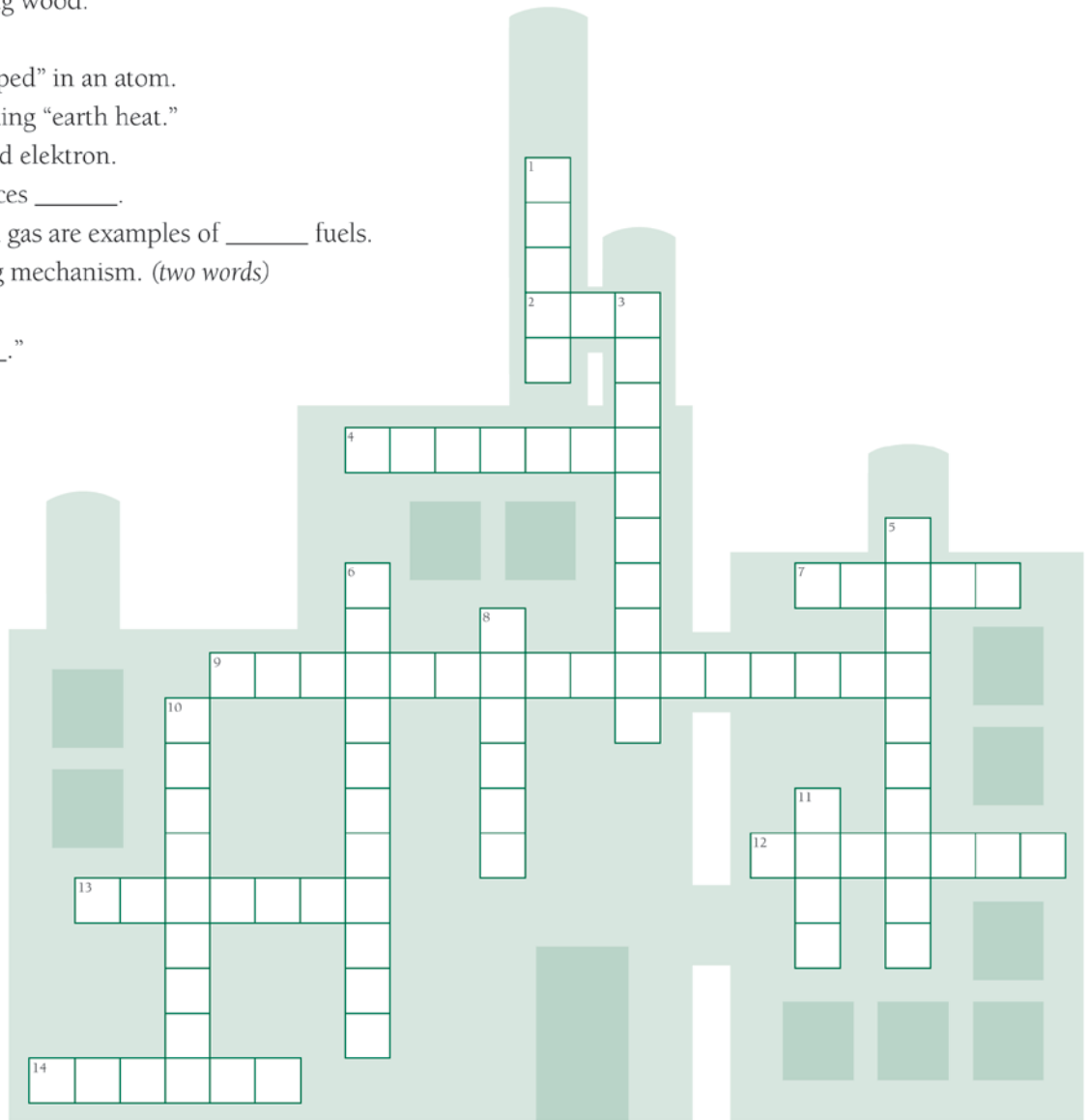
Activity Sheet

CROSSWORD PUZZLE

Can you complete this puzzle using the information about energy you have learned?

Clues

1. Energy from the sun.
2. Byproduct of burning wood.
3. Energy from water.
4. Type of energy “trapped” in an atom.
5. Type of energy meaning “earth heat.”
6. From the Greek word elektron.
7. Boiling water produces _____.
8. Coal, oil and natural gas are examples of _____ fuels.
9. Earth’s heat-trapping mechanism. (*two words*)
10. Stored energy.
11. “Blowing in the _____.”
12. Organic material used as fuel.
13. Energy in motion.
14. Power source for many industrial facilities.



Answers to Crossword Puzzle: 1. solar 2. ash 3. hydropower 4. nuclear 5. geothermal 6. electricity 7. steam 8. fossil 9. greenhouse effect 10. potential 11. wind 12. biomass 13. kinetic 14. boiler



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