



Title: Energy Sources Relay Game Activity			
Course: General Science, Physical Science, Earth Science, Environmental Science, Geography, History			Duration: 30 mins
Grade Level: 4-12			
Author: NEED Project https://issuu.com/theneedproject/docs/energygamesandicebreakers_85a2b1ee961b04/63			
Objective: Students will use inferences and create conclusions on the types of energy clues presented on each card			
Summary of Lesson: After the students are introduced to the different types of energy sources we have on Earth, they will use clues to determine which source of energy is presented on each card and to then compete to be the first group done to “win a prize.”			
Arkansas State Standards:			
SUBJECTS	GRADE LEVELS	CODE	STANDARD
GENERAL SCIENCE	4-5	3-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
GEOGRAPHY	6-8	6-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
EARTH SCIENCE	9-12	ES2-ETS1-1	ES2-ETS1-1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. [
		ES2-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints,



			including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
		ES-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
		ES-ESS3-2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
		ES-ESS3-4	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
PHYSICAL SCIENCE	9-12	PSI-PS3-3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
		PSI4-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts. [
ENVIRONMENTAL SCIENCE	9-12	EVS-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrences of natural hazards, and changes in climate have influenced human activity.
		EVS-ESS3-2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
HISTORY	7-12	Economics	E.1 Students will understand the impact of economic decision-making. This includes the exchange of goods and services; role of producers, consumers, and government in the marketplace; and growth, stability, and interdependence within a global economy.
		Geography	G.1 Students will understand the purpose of



			geographic tools (e.g., maps, globes, charts, graphs) to understand, analyze, and explain human interaction with each other and with the environment. This includes the spatial characteristics and patterns of human settlement and connections between global regions.
		AR History	<p>H.5.ARH.3 Analyze economic developments in Arkansas during the early 20th century such as Monte Ne and Hot Springs resorts, oil boom, and the timber industry.</p> <p>H.4.ARH.10 Examine the effects of social and economic transformations on various regions and segments of the population, including the rise of various industries (e.g., oil, mining), prosperity, transportation networks (e.g., railroad growth), migration/immigration, and education reform.</p>

Teacher Excellence Support System (TESS):

Domain I: Planning and Preparation

- 1a: Demonstrating Knowledge of Content and Pedagogy
- 1d: Demonstrating Knowledge of Resources
- 1e: Designing Coherent Instruction
- 1f: Designing Student Assessments

Domain III: Instruction

- 3a: Communicating with Students
- 3b: Using Questioning and Discussion Techniques
- 3c: Engaging Students in Learning
- 3d: Using Assessment in Instruction

Instructional Strategies and Practices:

Drill and Practice

Bloom's Level:

Inference and Conclusions

Materials and Resources:

- www.arkansenergyrocks.com
 - Arkansas Energy Rocks educational website
- https://issuu.com/theneedproject/docs/energygamesandicebreakers_85a2b1ee961b04/63
 - The Need Project

Student Activity:



Day 1:

1. Below are links as needed to discuss types of energy sources for both renewable and nonrenewable to use as background knowledge and possible notes for class.

Propane	Wind	Solar	Hydropower
Coal	Nuclear	Natural Gas	
Biomass	Petroleum	Geothermal	

- <https://www.youtube.com/watch?v=DW0jTe80kmM>
How Much Land Does it Take to Power the World?
- <https://www.eia.gov/kids/energy-sources/nonrenewable.php#:~:text=Energy%20sources%20are%20of%20two,and%20wind%20are%20replenished%20naturally.>
 - Energy Kids-U.S. Energy Information Administration

2. After teaching about the types of renewable and nonrenewable energy to the students, the relay cards can be used as a practice or review of the material. The students will use inferences and making conclusions to determine the type of energy on each type of card. Printable cards below.

- A. Create 6 stacks of review cards and arrange students as needed to fulfill up to 6 groups. (make sure each pile is in a different order so they aren't guessing the same source at the same time)
- B. Hand each group the first card upside down.
- C. Then each group will turn over the first card at the same time
- D. Once the group decides the source, they are to bring you their first card and tell you the source, if correct give them the second card. Continue this for each group until a group completes guessing their pile. The first to answer all correctly and get tot the end of the pile is the winner. This game can be repeated as necessary for review.
- E. The Exit Slip can be used as an assessment to the game at the end of class

Energy Sources Relay Game Activity

EXIT SLIP

List the energy source from the clue provided:

1. I require the earth's gravity to work. _____
2. I produce noise pollution, but no air pollution. _____
3. Methane gas can be made from me. _____
4. I'm not usually available 24 hours a day. _____
5. I'm the cleanest burning fossil fuel. _____
6. I am found deep in the earth and under the ocean floor. _____
7. I'm transported chiefly by train. _____



8. I give off rays of energy in the form of radiation. _____

9. I get my energy as a result of radioactive decay. _____

10. I'm a portable source of heat energy and stored under pressure.

Energy Relay Activity

Instructions: There are clues about the 10 energy sources we have been reviewing on each of the printed cards. You will be divided into 6 teams and given a card at the top of your stack. It will be upside down and you are not to turn it over before I say begin.

Get Ready:

1. Separate energy cards into 6 stacks of ten cards, make sure colors are in all different orders so they aren't all guessing the same energy source at the same time.

2. Divide the class into 6 teams

Go:

1. When you give the signal, teams should turn over their cards and begin.

2. When they believe they have the correct answer, they bring the card to you with the source, if correct give them a second card, if wrong, they go back and try again.

3. The first team to get all 10 cards correct is the winner!

4. At the end of the game, review the clues and source of energy.



GAME CARDS: Best if laminated and a different color of paper for each different source, but each source on the same color for ex; Natural Gas-hot pink, Methane-Blue, and so on.

1. I am the cheapest way to generate electricity in the U. S.
2. I'm limited to certain geographic areas of the U. S.
3. My first generation plant was built in Niagara Falls in 1879.
4. I'm being used in 2,000 locations in the U. S.
5. I may disrupt wildlife and fish when a production facility is built.
6. I require the earth's gravity to work.



1. Most of the electricity produced by me comes from California.
2. I convert my mechanical energy directly into electrical energy with no fuel costs.
3. I produce noise pollution, but no air pollution.
4. My machinery can be horizontal-axis or vertical-axis,
5. Holland is famous for using me.
6. I'm caused by the uneven heating of the earth's surface.



1. Methane gas can be made from me.
2. Photosynthesis stores radiant energy in me.
3. I get my energy from wood, garbage and agricultural waste.
4. I can be used to generate electricity.
5. Ethanol can be made from me and used as a transportation fuel.
6. Burning me can produce air pollution.



1. I'm not usually available 24 hours a day.
2. I can be converted into electricity using photovoltaic cells.
3. I'm commonly used for water and home heating.
4. I work better in some parts of the country better than others.
5. I've been stored for millions of years in fossil fuels.
6. I'm free, but you must buy and maintain my equipment to capture me.



1. I heat more than half of the nation's homes.
2. I'm colorless and odorless.
3. My chemical name is methane.
4. Industry is my largest consumer in the U. S.
5. I'm the cleanest burning fossil fuel.
6. I'm transported most often by pipeline.



1. My major use is for transportation.
2. Americans use more of me than any other energy source.
3. Most of me is refined into gasoline.
4. I may produce water pollution and air pollution.
5. I am found deep in the earth and under the ocean floor.
6. Saudi Arabia has the world's largest known reserve of me.



1. I am a fossil fuel.
2. I'm transported chiefly by train.
3. Efforts are made to remove sulfur from me.
4. I'm America's most abundant source of energy.
5. My by-products, such as ash, are used to build roads and make cement.



1. I am energy stored in atoms.
2. I am clean, since no fuel is burned.
3. I was first used in 1957 to make electricity.
4. Some people think I am unsafe, others think I am the best way to generate electricity.
5. I give off rays of energy called radiation.
6. Nevada may someday store my waste products.



1. I first produced electricity in 1904.
2. I'm used mainly in western states.
3. I can be used for home heating.
4. My energy comes from beneath the earth's surface.
5. My major job is production of electricity.
6. I get my energy as a result of radioactive decay.



1. I'm colorless and odorless.
2. Over half of me comes from processing natural gas.
3. My largest use is in rural areas.
4. I was discovered by scientists in 1912, though I had been around for millions of years.
5. I'm a portable source of heat energy.
6. I'm normally stored under pressure.