Title: Energy Sources

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Course: Science, Language Arts, Library Media

Grade Level(s): 7-8

Duration: at least one week (45 minute periods)

Objective:
Students will research energy sources.

Summary of Lesson:
Students will research an energy source (solar, wind, geothermal, hydroelectric, coal, nuclear, natural gas, biofuel, etc.) and share their information in a presentation to the class. Requirements for the presentation will be selected by the students with the teacher's guidance

Arkansas Standards:

Subject:	Grade Level(s):	Code:	Standard:
Science	7	7-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. [Clarification Statement: Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).]
Language Arts	7-8	RI.7.1 RI.8.1	Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
		RI.7.2 RI.8.2	Examine a grade-appropriate informational text. ● Provide an objective summary. ● Determine a central idea in a text and analyze its development.

		RI.7.4 RI.8.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.
		W.7.1 W.8.1	Write arguments to support claims with clear reasons and relevant evidence.
		W.7.2 W.8.2	Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
		W.7.4 W.8.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
		W.7.8 W.8.8	Gather relevant information from multiple print and digital sources, using search terms effectively. ● Assess the credibility and accuracy of each source. ● Quote or paraphrase the data and conclusions of others while avoiding plagiarism. ● Follow a standard format for citation.
		W.7.9 W.8.9	Draw evidence from literary and/or informational texts to support analysis, reflection, and research.
		SL.7.1 SL.8.1	Engage effectively in a range of collaborative discussions ● one-on-one ● in groups ● teacher-led with diverse partners on Grade 7-8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
		SL.7.3 SL.8.3	Determine a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.
		SL.7.4 SL.8.4	Present claims and findings, emphasizing primary points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.
		SL.7.5 SL.8.5	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize the primary points.
Library Media	7-8	IL.1.7.1 IL.1.8.1	Utilize knowledge of school library media center organization to locate resources by referring to • major sections (e.g., fiction, nonfiction, reference, digital resources, periodicals, special collections) • statement of responsibility (e.g., author, editor, illustrator)

			• Dewey Decimal Classification System
		IL.1.7.7 IL.1.8.7	Select and interpret various types of information on a topic using a variety of print/non-print/digital resources (e.g., atlases, audiobooks, books, databases, dictionaries, eBooks, encyclopedias, globes, maps, videos, websites, periodicals, thesauri, almanacs, photographs, charts, graphs, diagrams, timelines, animations, interactive elements, primary sources, secondary sources, paintings)
		IL.1.7.9 IL.1.8.9	Utilize sources of information outside the school library media center (e.g., people, public libraries, digital resources, museums, virtual tours, special libraries).
		IL.2.7.1 IL.2.8.1	Apply organizational strategies to record information using available resources (e.g., graphic organizers, digital tools, notecards, note taking, summarizing, paraphrasing)
		IL.3.7.2 IL.3.8.2	Select appropriate information resources using established criteria (e.g., usefulness, relevance, clarity of organization, currency, validity, authority, domains, scope, bias, readability, and accuracy).
		SR.4.7.3 SR.4.8.3	Respect and follow copyright laws when compiling information (e.g., © symbol, plagiarism, copyrighted works, intellectual property rights, Creative Commons, fair use guidelines)
		SR.4.7.4 SR.4.8.4	Create citations and bibliographies using a standard format for all resources, with guidance.
		SR.5.7.1 SR.5.8.1	Employ interpersonal skills when communicating formally and informally (e.g., listen attentively, respond respectfully, and seek a variety of viewpoints).
		SR.5.7.2 SR.5.8.2	Analyze and convey information clearly using a variety of formats.
		SR.5.7.3 SR.5.8.3	Interact and collaborate with peers, experts and others employing a variety of digital environments and media to gather and share resources, information, and ideas.
		SR.5.7.4 SR.5.8.4	Utilize the collaborative process effectively and efficiently.
		PG.7.7.1 PG.7.8.1	Synthesize new knowledge individually and collaboratively (e.g., discussions, presentations).
		PG.8.7.1 PG.8.8.1	Demonstrate knowledge gained from reading self-selected • informational texts • literary texts • multicultural texts (e.g., book talks, report outs, narrative writings, exit

			slips, graphic organizers, digital works, genre comparisons, literary adaptations, multimedia products).
		PG.9.7.1 PG.9.8.1	Utilize self-assessment tools for revision (e.g., checklists, peer reviews, rubrics, and self-generated assessments).

Teacher Excellence and Support System:
1c: Setting instructional outcomes, 1e: Designing coherent instruction, 1f: Designing student assessment, 2b: Establishing a culture for learning, 3b: Using question/prompts and discussion, 3c: Engaging students in learning, Using assessment in instruction, 3e: Demonstrating flexibility and responsiveness

Instructional Strategies and Practices:
Students will brain storm, with the teacher's guidance, what needs to go into the presentation (pros and cons, energy flow map, etc.).

Bloom's Level: *(Highest Level Only)*
Synthesis

Materials and Resources:
Students will need access to computers with internet link, software such as PowerPoint for presentation (if necessary), art supplies for individual and group reports

Formative Assessment:
- Rubric for presentation
- Peer evaluation (each student does one for the presentation and one for themselves.)

Teaching Notes:
Key vocabulary: renewable, nonrenewable, fossil fuel, chemical energy, mechanical energy, alternative, energy, potential energy, kinetic energy, law of conservation of energy, thermal energy, nuclear energy, electrical energy, electromagnetic energy, geothermal hydroelectric, biomass, solar energy.

Student Activity:

1. Whole group: Students will determine what needs to go into the presentation on energy sources, how many sources, how long presentation needs to be. Teacher will ensure that an energy flow map and pros/cons are added. Other suggested topics:

    - Is this source of energy renewable or nonrenewable?
    - What is meant by a renewable energy source? What are some examples?
    - What is meant by a nonrenewable energy source? What are some examples?
    - Discuss major differences between nonrenewable and renewable/alternative energy sources.
    - What is a fossil fuel?

- What are the major forms of fossil fuels?
- How were fossil fuels formed?
- How are these fuels collected?
- What are the advantages and disadvantages of using fossil fuels
- How does this technology work?
- How might this energy resource be used?
- What are some examples of its current use?
- What is the environmental impact of this technology?
- What is the cost of this technology?
- Are there hidden environmental and social costs to this source?
- Is this technology widely accepted today? Why or why not?
- What obstacles have to be overcome for it to be accepted?
- Do you know of any places where renewable/alternative energy sources are regularly being used
- What are the potential impacts of this type of energy?
  - Environmental
  - Economic
- What are the benefits?
- What are the drawbacks?
- What is the greatest factor that has kept this energy sources from being universally accepted/adopted?
- How much would it cost a household to do renewable energy?

2. Assign individual or small group reports: (Individual reports might be preferable because some students may decide to do PowerPoint presentations and it may be difficult to arrange time for them to work together as a group.)

3. Students will prepare a presentation on their energy topic (**solar, wind, geothermal, hydroelectric, coal, natural gas, biofuel, nuclear, etc.**) to include the information decided on by the group/teacher. Special education and gifted and talented students could have more/fewer requirements to meet individualized plans.

4. Students complete a rubric for each presentation, including their own. (See Student Handout)

5. Teacher evaluates presentations using rubric. (See Student Handout)

Student Handouts: See web site for a printable copy:
http://www.arkansasenergyrocks.com/educators/lesson-plans-k-8/

Peer Evaluation Form

Name of Peer Evaluator (your name) _____

Names of Students Presenting _____

Issue/Area _____

Instructions: Above, fill out you name, the names of the presenters, and the subject of the presentation. Then, use your best judgment to evaluate the presenter(s) by the rubric below (seven being the best, one the worst.) You may add comments in the text box associate with each section if you wish. Please make all comment constructive/helpful.

1. **Subject** Was the presentation informative? Did you learn something you did not know before?

   1…2…3…4…5…6…7

   _____
   _____
   _____

2. **Research** Was the research comprehensive? Did the student appear to be experts in their subject area? Did they push beyond the bare minimum to create something truly interesting? Did they use outside research to offer a critical perspective?

   1…2…3…4…5…6…7

   _____
   _____
   _____

3. **Organization/visuals** Was the presentation easy to follow? Was there a clear introduction and conclusion? Were the visuals appropriate in content and number?

   1…2…3…4…5…6…7

   _____
   _____
   _____

4. **Preparation and style** Had the presenter mastered their material? Did presenter ably field questions from the class? Did presenter maintain eye contact with class members as they were speaking? Any nervous habits you observed which presenter should be aware of for the future?

   1…2…3…4…5…6…7

   _____
   _____
   _____

Rubric for Energy Presentation

Category	4	3	2	1	Score
Comprehension	Student is able to accurately answer almost all questions posed by classmates about the topic	Students is able to accurately answer most questions posed by classmates about the topic	Student is able to accurately answer a few questions posed by classmates about the topic	Students is unable to accurately answer questions posed by classmates about the topic	
Evaluates Peers	Fills out peer evaluation completely and always gives scores based on the presentation rather than other factors (e.g. person is a close friend)	Fills out almost all the peer evaluation and always give scores based on the presentation rather than other factors.	Fills out most of the peer evaluation and always gives scores based on the presentation rather than other factors	Fills out most of the peer evaluation but scoring appears to be biased.	
Listens to other presentations	Listens intently. Does not make distracting noises or movements	Listens intently but has one distracting noise or movement	Sometimes does not appear to be listening but is not distracting	Sometimes does not appear to be listening and has distracting noises or movements	
Vocabulary	Uses vocabulary appropriate for the audience. Extends audience vocabulary by defining words that might be new to most of the audience	Uses vocabulary appropriate for the audience. Includes 1-2 words that might be new to most of the audience, but does not define them	Uses vocabulary appropriate for the audience. Does not include any vocabulary that might be new to the audience	Uses several (5 or more) words or phrases that are not understood by the audience.	
Content	Shows a full understanding of the topic	Shows a good understanding of the topic	Shows a good understanding of parts of the topic	Does not seem to understand the topic very well	
Organization	Information is very organized with well-constructed headings and subheadings	Information is organized with well-constructed headings	Information is organized, but heading, subheadings are not well-constructed	The information appears to be disorganized	
Amount of information	All topics are addressed and all questions answered with at least 2 sentences about each	All topics are addressed and most questions answered with at least 2 sentences about each.	All topics are addressed, and most questions answered with 1 sentence about each	One or more topics were not addressed	

Category	4	3	2	1	Score
Quality of information	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples	Information clearly relates to the main topic. No details and/or examples are given	Information has little or nothing to do with the main topic	
Sources	All sources (information and graphics) are accurately documented in the desired format	All sources (information and graphics) are accurately documented, but a few are not in the desired format	All sources (information and graphics) are accurately documented, but many are not in the desired format	Some sources are not accurately documented.	
Diagrams & illustrations	Diagrams and illustrations are neat, accurate and add to the reader's understanding of the topic	Diagrams and illustrations are accurate and add to the reader's understanding of the topic	Diagrams and illustrations are neat and accurate and sometimes add to the reader's understanding of the topic	Diagrams and illustrations are not accurate OR do not add to the reader's understanding of the topic	Total _____/40