Title: Energy Sources

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Course: Science

Grade Level: 7

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

Standards: CCSS, Arkansas State Frameworks, Next Generation Science Standards, Other

Code:	**Standard:**
Common Core State Standards	
RST-7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.
WHST-1	Write arguments focused on discipline-specific content
WHST-7	Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
WHST-9	Draw evidence from information texts to support analysis reflection, and research.
Science	
PS.7.7.1	Identify natural resources used to supply energy needs.

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 teachers 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)

See Student Handout