Physical Science Outcome Energy Project

Your Task: You will be researching a current energy topic to learn more about the technology or issue, its historical development, current controversy, current importance, and predictions for the future.

Specifically, you will be:
• Developing a detailed OUTLINE about your research,
• Creating a POSTER to synthesize the information in your research, and
• Preparing a PRESENTATION to share with your class information about your topic.

You will have some time in class to research and compile information, but significant work will also have to be completed outside of class time. Remember, this is an outcome assignment (worth a test grade) so I expect thoughtful and complete work.

You have the option to complete this assignment individually or with a partner. If you choose to work with a partner, understand that I expect that each partner contribute equally. Do not select a friend as a partner if you suspect that they may not complete half of the necessary work.

Possible Energy Topics: You will have the opportunity to request topics for research. I will approve the final topic selection. Below is a list of possible topic ideas, but you are free to suggest energy-related topics not included on this list. Realistically, some of these topics are too big for one assignment so you will have to narrow your focus once you get started. You may also choose to focus your attention on a specific geographic region like within Wisconsin, the Midwest, the U.S., or some other country/region.

Possibilities Include:
• Solar Energy
  o Photovoltaic Panels
  o Hot Water Heating
  o Water Purification
  o Other Types of Solar Technology
  o Solar Vehicles
• Wind Power
  o Off Shore
  o Household
  o Municipal Use
• Geothermal Energy
  o Power Plants
  o Heat Pumps or Smaller Scale Use
• Hydroelectric Energy
  o Dams
  o Wave/Tidal Power
• Hybrid Vehicles
  o Parallel
  o Series
  o Synergy
• Hydrogen Power
  o Vehicles
  o Fuel Storage Options
• Electric Vehicles
• Compressed Air vehicles
  • Alternative Vehicle Fuels
    o Ethanol
    o Bio-diesel
    o Vegetable oil
• Manure Digesters
• Alternative Transportation Methods
  o Mass Transit Systems
  o City Planning
  o Maglev Trains
• Home & Building Energy Efficiency
  o Building Techniques
  o Insulation Options
  o Lighting & Appliances
  o Heating & Cooling
  o Building Sizes
• Energy in Politics
  o Pick a specific state or federal bill/law related to energy
  o Developing countries’ use of energy
  o Developed countries’ use of energy
• Energy & the Environment
  o Land Use & Energy
  o Pollution & Energy
  o Mining & Energy
  o Off-Shore Drilling & Energy
Your approved Topic = 

Pre-Research Ideas: Now that you know what you will be researching, write a paragraph or two describing what you already know about the topic. Explain why this topic interests you and what you hope to learn. If you feel that you know little about your topic, include any ideas you have and focus your paragraph on questions you want to answer.

Write here:
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Deadlines:

• Computer Lab Research Time: __________________________
• Submit Final Outline for Description including sources & notes: ____________________________
• Computer Lab Research Time: __________________________
• Submit Final Outline for Historical Development including sources & notes: ________________
• Submit Final Outline for Controversy and Importance including sources & notes: ______________
• Submit Final Outline for Future and Personal Synthesis including sources & notes: ___________
• Poster Due: ___________________________
• Presentation: _________________________
**Research Guidelines:** You will be researching your assigned topic. **You are required to take notes as you research.** You must record the source for each note you take. We will talk about possible methods for linking notes to sources in class. Your final research will be presented using a formal outline. And, you must include a bibliography with your sources in MLA format.

Sections of your Outline will include (Each bolded term could be a different Roman numeral in your outline.)

- **Description:**
  - Explain, describe and define the technology or issue involved.
  - Find useful pictures and diagrams that help explain the concept.
  - This section should clearly show you understand what your topic is.

- **Historical Development:**
  - Describe important background history leading to the current development of your topic.
  - When did research/use begin?
  - Why did it start?
  - At what times did the technology/information greatly improve?
  - Why?
  - What people and/or organizations were/are vital to the development of your topic?

- **Controversy:**
  - Explain the different sides/perspectives related to your topic.
  - What options are available for addressing the purpose of your topic?
  - This section might include advantages and disadvantages of different ideas/perspectives.

- **Importance:**
  - Clarify what makes your topic an important issue TODAY (this year).
  - What people, groups or organizations are interested in this topic? Who cares?
  - Who is spending money on research/development/purchase?

- **Future:**
  - What are the different predictions for what will happen with your topic in the near future? Far future?
  - What are the predictions based on?
  - Are they good, bad, neutral predictions?
  - What is the overall prediction for the future?

- **Personal Synthesis:**
  - What is your position or feelings about the issue? **EXPLAIN.**
  - What are your own predictions for the future? Why do you think so?
  - What things are limiting this topic?
  - If you are working with a partner, you can select to each write a personal synthesis or create a combined partnership synthesis.
  - Remember: You should re-read your pre-research information because it will remind you of your initial mindset and might help you trace any changes in your thoughts/feelings about the topic.

**Sources:** You must keep track of your sources by noting which source provided the information necessary for your notes. Notes may be hand written or typed. Again, notes must refer to a specific source. Also, you will develop a bibliography that provides specific details about your sources using MLA format. Information about using MLA format can be found in the library, online, by talking with your English teacher or by talking with me. In general, MLA requires author, creation/modification date, title, publisher (if book) or URL (if website) and date accessed (if website).
Creating Formal Outlines: Your research will be submitted to me using a formal outline.

Why Outline?
The first purpose is to provide an organized way of recording information you read or hear. The second is to use the outline as a study tool.

What does an outline include?
- Information about a specific topic.
- The information should be detailed (there should be lots of it), however …
- The information should be relevant (important) and does not have to be in complete sentences. (In fact, using phrases and words instead of complete sentences often makes it easier to review later.)
- The information included below a Roman numeral, letter or number should serve as supporting detail(s) for the information above it.

What does an outline look like?
- Outlines use:
  - Roman Numerals (I, II, III, IV, V, VI, …)
  - Capital Letters (A, B, C, D, E, …)
  - Numbers (1, 2, 3, 4, 5, …)
  - Lower Case Letters (a, b, c, d, e, …)
  - Lower Case Roman Numerals (i, ii, iii, iv, v, vi, …)
- You only need as many Roman numerals, letters and/or numbers as you have information for. (Some outlines are smaller than others …)
- Indent your information as demonstrated above so that supporting information is located farther in the page compared to the main idea.

Sample Outline:
Biodiversity = the variety and amount of life on Earth and the connections supporting these organisms.

I. Importance of Biodiversity
   A. Food, Medicines, and natural products
      1. Cross-breeding with wild versions (other genetic varieties) improves disease resistance
      2. 20% of medicines come directly from plants.
      3. Natural world provides raw material for much of what we use everyday
   B. Economic benefits
      1. Healthy (non-polluted and high biodiversity) environment attracts tourists, encourages businesses to develop in the area
      2. High biodiversity and healthy environment mean fewer costs for treatment of resources
   C. Natural Beauty
   D. Community of Life
      1. Humans are connected to other organisms on Earth
      2. Responsibility to value nature (even if it has no specific economic value)

II. Threats to Biodiversity
   A. Population Growth and Resource Consumption
      1. Increasing Earth Population (over 6.5 billion people and continuing to grow)
      2. Demands for Survival increasing
         a. Fresh water
         b. Fuel
      3. Demands for material goods and services increasing
   B. Exotic and Invasive Species
      1. Non-native plants and animals can out-compete native species and reduce the original biodiversity
      2. Connected to high economic cost to humans
         a. Destruction of habitat and/or human-created items by non-native
         b. Unavailability of a native organism that humans used
   C. Commercial Exploitation
      1. Over-fishing: many fish species are close to extinction
      2. Industrial-scale logging: destroys habitats for animals within forests
      3. Illegal hunting and trade of some endangered and/or unusual animals

** Outline structure is important, but not everyone creates an outline that looks exactly like another person’s outline and that’s OK! The important thing is that you have followed the outline structure to the best of your ability and you have included as much detail as possible. **
**Poster:** Once you have submitted all parts of your formal outline, you will be creating a poster to present key information to the class. The poster must contain:

- Title
- Your Name on the front
- Headings for each section:
  - Description
  - History
  - Controversy
  - Importance
  - Future
  - Personal Synthesis
- No complete sentences for the information found in each section
- At least 6 pictures and/or diagrams that usefully explain aspects of your topic. All pictures that are not hand-drawn must have source citation next to the picture and on the front of the poster.
- Entire Bibliography used to compile the larger formal outline (Remember: You’ve already done this work – just compile the bibliographies used for each section of the outline). Bibliography should be taped to the BACK of the poster
- Neatness, organization and creativity matter. (Refer to your rubric.)

**Presentation:** You will present key information to the class in a 4-5 minute presentation.

Content of the Presentation:
- Explanation of topic
- Brief description of the history leading to current state
- Controversy surrounding your topic
- Importance of this energy topic today
- Personal opinions about your topic

Presentation Skills:
- Prepare ahead of time so that you are NOT reading the poster to us.
- Look at your audience – keep your eyes on us.
- Use a good voice volume.
- Dress appropriately for a presentation.

Listener Skills:
- Be polite during presentations – Do not interrupt presenter.
- Ask relevant questions after the presentation.
- Complete the listener guide.
### Energy Project Rubric:

<table>
<thead>
<tr>
<th></th>
<th>0 points</th>
<th>1 point</th>
<th>2 points</th>
<th>3 points</th>
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</thead>
<tbody>
<tr>
<td><strong>Deadlines &amp; Class Time</strong></td>
<td>Missed many and/or wasted class time</td>
<td>Missed two deadlines and/or unprepared for work during class</td>
<td>Missed one deadline and/or could have used class better on one day</td>
<td>All deadlines met &amp; very productive use of class time</td>
</tr>
<tr>
<td><strong>Research Notes</strong></td>
<td>Missing</td>
<td>Missing some links to sources or incomplete summarizing</td>
<td>Missing some links to sources or incomplete summarizing</td>
<td>Notes relevant, linked to a specific source and in your own words. Source material is included or links provided</td>
</tr>
<tr>
<td><strong>Final Outline Format</strong></td>
<td>Missing</td>
<td>Missing some of the key aspects, but much of the formatting is still included. Outline has logical flow</td>
<td>Missing some of the key aspects, but much of the formatting is still included. Outline has logical flow</td>
<td>Outline includes title, no complete sentences, hierarchy (Roman numerals, letters, numbers), indentation, &amp; logical flow</td>
</tr>
<tr>
<td><strong>Final Outline Content</strong></td>
<td>Very incomplete</td>
<td>Insufficient information: much of the necessary information is not included. OR much of the outline is NOT in your own words (2 points)</td>
<td>Incomplete information; missing some of the needed information to truly understand topic (4 points)</td>
<td>Excellent background information for understanding topic: well-defined and described including relevant types. Sufficient information (6 points)</td>
</tr>
<tr>
<td><strong>Works Cited</strong></td>
<td>Missing</td>
<td>Incomplete source citations OR questionable sources</td>
<td>Missing some sources OR list of sources only includes URLs visited without other information</td>
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### Historical Development Outline:

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<td>Incomplete information; missing some of the needed information to truly understand history of topic (4 points)</td>
<td>Excellent description of history leading up to topic. Includes beginning of research, intermediate points &amp; current status, important people/groups (6 points)</td>
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### Controversy & Importance Outline:

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<td>Very incomplete</td>
<td>Insufficient information: much of the necessary information is not included. OR much of the outline is NOT in your own words (2 points)</td>
<td>Incomplete information; missing some of the needed information to truly understand controversy &amp; importance of topic (4 points)</td>
<td>Excellent description of controversy &amp; importance of topic. Includes description of multiple perspectives, where money is being spent, options &amp; why it is important TODAY (6 points)</td>
</tr>
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### Future & Personal Synthesis Outline:

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<td>Insufficient information: much of the necessary information is not included. OR much of the outline is NOT in your own words (2 points)</td>
<td>Incomplete information; missing some of the needed information to truly understand how you based your predictions and/or personal explanation was incomplete (4 points)</td>
<td>Excellent prediction about how topic is likely to proceed. Clearly described own position &amp; feelings about issue. (6 points)</td>
</tr>
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</tr>
<tr>
<td>Overall Structure</td>
<td>Missing</td>
<td>Missing considerable organization, poster is difficult to read &amp; hard to find relevant information</td>
<td>Missing one of these OR some disorganization</td>
<td>Poster includes title, headings for each section, relevant pictures/diagrams, readable &amp; well organized</td>
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<tr>
<td>Issue Description</td>
<td>Missing</td>
<td>Missing some key information</td>
<td>Includes all relevant information, but in sentence format</td>
<td>Issue is well described and defined with useful pictures/diagrams; uses NO complete sentences</td>
</tr>
<tr>
<td>Historical Development</td>
<td>Missing</td>
<td>Missing some key information</td>
<td>Includes all relevant information, but in sentence format</td>
<td>Historical development is clear with key points included along with relevant people &amp; organizations; uses NO complete sentences</td>
</tr>
<tr>
<td>Controversy</td>
<td>Missing</td>
<td>Missing some key information</td>
<td>Includes all relevant information, but in sentence format</td>
<td>Multiple perspectives are summarized completely including useful pictures/diagrams; uses NO complete sentences</td>
</tr>
<tr>
<td>Importance</td>
<td>Missing</td>
<td>Missing some key information</td>
<td>Includes all relevant information, but in sentence format</td>
<td>Clear explanation of why this topic is important to society today including useful pictures/diagrams; uses NO complete sentences</td>
</tr>
<tr>
<td>Future</td>
<td>Missing</td>
<td>Missing some key information</td>
<td>Includes all relevant information, but in sentence format</td>
<td>Clear prediction of where this issue might go in the future and WHY this outcome is likely; uses NO complete sentences</td>
</tr>
<tr>
<td>Personal Synthesis</td>
<td>Missing</td>
<td>Missing some key information</td>
<td>Reasoning is a little unclear</td>
<td>Detailed personal position regarding topic including explanation for your reasoning</td>
</tr>
<tr>
<td>Pictures</td>
<td>Missing</td>
<td>Included at least 1 useful picture/diagram with source (if necessary)</td>
<td>Included at least 3 useful pictures/diagrams with sources (if necessary)</td>
<td>Included at least 6 useful pictures/diagrams with sources (if necessary)</td>
</tr>
<tr>
<td>Creativity</td>
<td>Missing</td>
<td>Some attempt is made</td>
<td>Poster is creative, neat and informative</td>
<td><strong>Extra credit</strong>: Poster goes beyond expectations with creative presentation of information**</td>
</tr>
<tr>
<td>Sources</td>
<td>Missing</td>
<td>Incomplete source citations or questionable sources</td>
<td>Missing some sources OR list of sources includes URLs visited without other information</td>
<td>A complete bibliography in MLA format is attached to the back of the poster</td>
</tr>
</tbody>
</table>

**Presentation:**

<table>
<thead>
<tr>
<th>Preparation &amp; Skills</th>
<th>Did not present at all</th>
<th>Never gave presentation to full class, only to the teacher</th>
<th>Did a nice job, but fumbled a bit due to incomplete preparation OR just read information off of poster</th>
<th>Clearly had prepared for this presentation and had good skills (eye contact, voice, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Missing</td>
<td>Incomplete presentation – more information would be needed for audience to understand topic</td>
<td>Missing one of these OR included non-key idea information</td>
<td>Presentation clearly explained the topic, including a brief historical development and detailed description of controversy and importance. Clearly expressed own thoughts and feelings about the topic</td>
</tr>
<tr>
<td>Audience</td>
<td>Missing listener guide OR poor audience behavior during presentations</td>
<td>Incomplete listener guide OR somewhat poor behavior during presentations</td>
<td>Complete listener guide AND excellent audience behavior during presentations</td>
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</tr>
</tbody>
</table>

**Final Energy Project Grade: **_________ out of 100 points (Mastery is 70 points)**