# Lesson Plan Title: Energy in Indiana

**Teacher Name:** Mrs. Kim Mayes  
**School:** Franklin Community Middle School  
**Subject:** Science  
**Grade Level:** 7th

## Problem statement, Standards, Data and Technology

### Asking questions and defining problems

Establish driving question for the lesson plan or define problem students will be solving.

Attach any documents used to establish the driving question or define the problem.

- What are the environmental impacts of obtaining and utilizing various energy resources in Indiana and which energy resource is the most beneficial and efficient in your assigned area of Indiana?

Main Resources
- [http://www.doe.in.gov/standards/science-computer-science](http://www.doe.in.gov/standards/science-computer-science) (Indiana state standards)
- [http://www.purdue.edu/discoverypark/energy/programs/energy-academy/resources/index.php](http://www.purdue.edu/discoverypark/energy/programs/energy-academy/resources/index.php) (some of the links were listed on this site)

### Incorporating Next Generation Science Standards, Common Core, or State Standards

State the standards that will be covered during this lesson plan. Include all standards which may apply (NGSS, Common Core, or State Standards).

- 7.ESS.7 Describe the positive and negative environmental impacts of obtaining and utilizing various renewable and nonrenewable energy resources in Indiana. Determine which energy resources are the most beneficial and efficient.
- SEPS.1 Posing questions
- SEPS.3 Constructing and performing investigations
- SEPS.4 Analyzing and interpreting data
- SEPS.6 Constructing explanations
- SEPS.7 Engaging in argument from evidence
- SEPS.8 Obtaining, evaluating, and communicating information
- 6-8.LST.1.1: Read and comprehend science and technical texts within a range of complexity appropriate for grades 6-8 independently and proficiently by the end of grade 8.
- 6-8.LST.2.1: Cite specific textual evidence to support analysis of science and technical texts for citation (e.g., APA or CSE).
- 6-8.LST.4.1: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- 6-8.LST.4.2: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
<table>
<thead>
<tr>
<th><strong>Obtaining and evaluating information</strong></th>
<th>Students, while in small groups, will be obtaining and evaluating information through a variety of resources online.</th>
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</table>
| How will students be obtaining and/or collecting the information? | **6-8.LST.6.2**: Use technology to produce and publish writing and present the relationships between information and ideas clearly and efficiently.  
**6-8.LST.7.1**: Conduct short research assignments and tasks to answer a question (including a self-generated question), or test a hypothesis, drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.  
**6-8.LST.7.2**: Gather relevant information from multiple sources, using search terms effectively; annotate sources; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format.  
**6-8.LST.7.3**: Draw evidence from informational texts to support analysis, reflection, and research.  
**6-8.NC.1** Collaboratively design, develop, publish, and present products (e.g., videos, podcasts, websites) using technology resources that demonstrate and communicate curriculum concepts.  
**6-8.DI.3** Represent data in a variety of ways (e.g., text, sounds, pictures, and numbers), and use different visual representations of problems, structures, and data (e.g., graphs, charts, network diagrams, flowcharts).  
**6-8.IC.1** Exhibit legal and ethical behaviors when using technology and information and discuss the consequences of misuse. |
<table>
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<tr>
<th><strong>Analyzing and interpreting data</strong></th>
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<tbody>
<tr>
<td>How will students be analyzing and interpreting the collected data?</td>
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<tr>
<td>Students will use the provided resources and possibly other sites they find to research the energy sources of Indiana and then focus on their area of Indiana. They will check to make sure they are only using valid information in their project by finding the same information on at least 2 different sites.</td>
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<tr>
<th><strong>Use of technology and software</strong></th>
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<tr>
<td>Indicate the type of technology and software students will be using in order to implement this lesson plan.</td>
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<tr>
<td>Students will use their chromebooks, internet, Google docs or sheets for compiling of information, and Google Slides for presenting the information to the class.</td>
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<tr>
<th><strong>Collaboration, critical thinking and communication</strong></th>
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<tr>
<td><strong>Collaboration</strong></td>
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<tr>
<td>Indicate how students will be collaborating during the implementation of the lesson plan</td>
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<tr>
<td>Students (groups of 3-4) will discuss what they are finding during their research and enter the information on a shared google doc or google sheet that everyone in the group has access to. During the first 15 minutes of collaboration, students will decide who is responsible for which questions for their region and what font color they will be using during the presentation. After the research time is finished students will collaborate to figure out which order their slides should be in for their presentation.</td>
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<th><strong>Critical Thinking</strong></th>
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<td>How will the students evaluate the question or defined problem to reach an objective conclusion? How will the students being using the learned content and collected data to be able to critically think about the established question and/or problem on this lesson plan?</td>
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</table>
| Students will research the following items about their assigned Indiana area:  
1.) What type of energy sources are available in your assigned Indiana area?  
2.) Are the energy sources renewable or nonrenewable?  
3.) How are each of the energy sources in your area used? (Be sure to include the following sectors: residential, commercial, industrial, and transportation)- This is where charts/ graphs would be needed  
4.) What are the environmental impacts of obtaining and/ or using the particular energy sources in your assigned Indiana area? This is where pictures can be used to increase understanding  
5.) What does the future look like for the energy sources in your area? (Are scientists trying to make the energy sources better or shut any down?)  
6.) What is the population like in your assigned area?  
7.) What is the average income in your assigned area? How does the income compare to the overall average income for Indiana? Charts or pictures would be helpful here  
8.) What is the land like in your area? Must include a map that shows the location of your area in Indiana also you... |
# STEM Energy Lesson Plan Elements Inclusion

Purdue University  
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<table>
<thead>
<tr>
<th><strong>Communication</strong></th>
<th>Students will give a brief presentation (3-5 minutes) to the class. All members of the class must be active in the presentation. Each group will be assigned a group to come up with a question to ask in regards to the presentation.</th>
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<tbody>
<tr>
<td><strong>Teacher’s References</strong></td>
<td></td>
</tr>
<tr>
<td>Include all references used to develop and implement this lesson plan.</td>
<td></td>
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|  | http://www.doe.in.gov/standards/science-computer-science  
|  | https://www.hobart.k12.in.us/jkousen/Biology/index[3].htm#Kathy  
|  | Energy 101 videos from the U.S. Department of Energy.  
|  | https://bites.nrel.gov/help.php  
|  | http://www.need.org/intermediate  
|  | http://www.in.gov/idem/5474.htm (Site where state is divided into 8 regions for making groups)  
|  | http://www.iasonline.org/page-1488295 (Site where state is divided into 7 regions for making groups)  
|  | http://www.in.gov/dhs/2797.htm (Site where state is divided into 10 regions for making groups)  |
| **Student References** |  |
| http://www.need.org/energyinfobooks (NEED project)  
| https://www.eia.gov/state/?sid=IN  
| https://www.eia.gov/state/analysis.php?sid=IN  
| http://www.in.gov/oed/2623.htm (This link contains many other links within it)  
| institute for energy research  
| Indiana energy study 2015 from Purdue University |  |

- Include some landscape pictures if it helps with understanding of your area
- 9.) What is the average cost of living in your assigned area? How does the cost of living here compare to the average cost of living all of Indiana? **Charts and/or graphs would be beneficial here**
- 10.) What are the top 5 employers in your area? In what sector do they belong?

**Group opinion Questions:**

1.) Which energy source do you feel is the most beneficial to your area? Why? *(Pictures or charts or diagrams would be helpful here)*

2.) Which energy source do you feel is the most efficient in your area? Why? *(Pictures or charts or diagrams would be helpful here)*
**Assessment Plan**

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<td>How will the students be assessed during and/or at the end of the lesson plan?</td>
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Initials by each item that is required for who is responsible for it along with a key of which student will be using which font color during the presentation.= 2 pts Group score (This is to be turned in within 15 minutes after getting into groups)

Students will be assessed on the completion of their notes over the area (Each student will be responsible for the questions that their group determined at the beginning)= 10 pts (This is due before the beginning of the 3rd day on the project.)

Students will be scored for their contribution to the Google presentation/ needed material from research is covered= 15 pts (This is due by the beginning of class on the 3rd day)- Each slide should not have too many words and make sure the font is in your color and the size of font is able to be read

Work cited on each slide= 2 pts

Opinion questions answered and reason why is evident on slide(s)= 10 pts (Group score)

Presentation time: (loud enough to hear and good pronunciation= 3 pts) ( can’t be heard well and/ or hard to understand= 1 pt)

Able to answer the question(s) during the presentation= 2pts (Group score)

Group has picked a question for their assigned presentation before the presentation= 1 pt (Group score)

**Overall project= 45 pts (15 is group grade/ 30 is individual grade)**
## Resources and Costs

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<tr>
<th>Resources Needed</th>
<th>Computers w/ internet</th>
<th>Google docs or sheets</th>
<th>Google slides</th>
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### Costs
List the estimated cost of implementing this lesson plan.

Include all costs related to equipment, materials and any resource critical to the implementation of the lesson plan.

### Implementation Plan

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<tr>
<th>Implementation Plan Timeline</th>
<th>2 periods (45 minutes each) for research</th>
<th>1 period (45 minutes) for creating the presentation</th>
<th>1 period (45 minutes)- to come up with the answer to the opinion question(s) and then practice the presentation and make any last minute adjustments to the project</th>
<th>1 period (45 minutes) for groups to share their information with the class</th>
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