<table>
<thead>
<tr>
<th>Lesson Plan Title: The Cost of Energy</th>
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</thead>
<tbody>
<tr>
<td>Teacher Name: Jonathan Yergin</td>
<td>School: Anderson Preparatory Academy</td>
</tr>
<tr>
<td>Subject: Earth Space Science</td>
<td>Grade Level: 9 - 12</td>
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### 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.

How can students become more aware of their current energy usage and what can they do to lower it?

Students will complete pre lab questions such as:
- What is a watt?
- How do you think it correlates to your everyday life?
- How much do you think you contribute to your parent’s electric bill?

**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).

**ES.3.4** Evaluate the use of sustainable versus nonrenewable resources. Explain the consequences of overuse and continued increased consumption of limited resources. Analyze and evaluate the benefits of researching, designing, and developing sustainable resources for private use and industry.

**Obtaining and evaluating information**
How will students be obtaining and/or collecting the information?

Students will be using watt meters and stop watches to determine the kilowatts and hour on various electronic devices.
### Analyzing and interpreting data
How will students be analyzing and interpreting the collected data?

Using the data collected students will then convert watts per second to kilowatt per hour. Using kilowatt per hour they will then convert that to a dollar amount. This can be accomplished using a spread sheet for less advanced students and an excel spread sheet for higher advanced students.

### Use of technology and software
Indicate the type of technology and software students will be using in order to implement this lesson plan.

Kill A Watt EZ meters, stop watches, various house hold electronics and calculators

### Collaboration, critical thinking and communication

#### Collaboration
Indicate how students will be collaborating during the implementation of the lesson plan

Students will be working in groups of two or three collecting data from different energy scenarios. Students will be analyzing the data and then sharing it on the white board. Once finished a group discussion with take place where the groups are given time to explain their findings.

#### Critical Thinking
How will the students evaluate the question or defined problem to reach an objective conclusion? How will the students be using the learned content and collected data to be able to critically think about the established question and/or problem on this lesson plan?

Students will be doing prior research into the definition of a Watt and Kilowatt. In their research students will define what a watt is along with how it relates to their everyday lives.
**Communication**
How will the students communicate their findings and conclusion regarding the established question and/or problem?

Students will be writing a lab report over their findings in which they are first asked to make a prediction of how many watts an average teenager uses and how much do those watts cost. They will conclude their lab report stating their findings.

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### References

**Teacher’s References**
Include all references used to develop and implement this lesson plan.


**Student’s References**
Include all references students will need to complete this lesson plan.

- [http://energyusecalculator.com/index.htm](http://energyusecalculator.com/index.htm)

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### Assessment Plan

**Assessment Plan**
How will the students be assessed during and/or at the end of the lesson plan?

Include resources that will be used to assess the students for the lesson plan.

A semi-formal lab report will be turned in showing their prediction, data and final conclusion along with their pre lab data.
Resources and Costs

Resources Needed
List all the resources needed (equipment, facilities, materials or any other resources).

<table>
<thead>
<tr>
<th>Kill A Watt</th>
<th>Power Strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various Light Bulbs (LED, CFL, Incandescent)</td>
<td>Extension Cord</td>
</tr>
<tr>
<td>Various household object’s</td>
<td></td>
</tr>
</tbody>
</table>

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.

Prices will vary depending on your location and where you purchase your supplies.

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kill A Watt</td>
<td>$28.97</td>
</tr>
<tr>
<td>2PK LED bulbs</td>
<td>$20.97</td>
</tr>
<tr>
<td>2 PK CFL bulbs</td>
<td>$7.95</td>
</tr>
<tr>
<td>4PK Incandescent</td>
<td>$5.97</td>
</tr>
<tr>
<td>Power Strip</td>
<td>$7.98</td>
</tr>
<tr>
<td>6ft Extension Cord</td>
<td>$11.97</td>
</tr>
<tr>
<td>Outlet to Bulb Adapter (x4)</td>
<td>$2.09</td>
</tr>
</tbody>
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Total: $92.19

Implementation Plan

Implementation Plan Timeline
Establish the timeline to implement the lesson plan.

Provide an estimate of time and days in order to complete the lesson plan.

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Lab / Lecture</td>
<td>Research</td>
<td>Work on Lab report</td>
</tr>
</tbody>
</table>