Energy Project

Introduction: We all use electricity, every single day! But where that electricity comes from can vary. There are several different forms of energy sources, and some are considered better than others. *If you could control how the school got its electricity, which energy source would you want the school to utilize?* To answer this question, you will have to know about different energy sources and their pros and cons.

The Big Goals:

* Be aware of the effects you and your family are having on the world’s energy resources.
* Know about different sources of energy, do research, and form an opinion on one.

Project Elements:

* Light Bulb Energy Use and Carbon Footprint – Each group member must fill out the worksheet on their household light bulb energy use and calculate their own carbon footprint. Each individual’s worksheet will be turned in.
* Solar Panel Article – Only one set of questions has to be turned in per group.
* Research – On the back of this page is a list of different energy sources. You must research and take notes on at least three before deciding on your focus. Remember to look up the pros and cons for the energy sources!
* Paragraphs – Each group will submit a written summary of their research 2-3 paragraphs long. These paragraphs will answer the question posed in the introduction and should briefly address why the particular energy source was chosen and the pros and cons of that source. A bibliography of the sources you used when doing your research needs to be present as well.
* Presentation – Each group will present their research and opinion to the class on Friday, December 6 in a 5-7 minute presentation. You must have some visual when your group presents and each group member needs to say something. You could use powerpoint, keynote, prezi, make a poster, or make a video and show that to the class instead of presenting live. Other presentation methods may be used as long as they are preapproved.
* Project as a Whole – All written elements are due at the time of the presentation. This page will be stapled to the front and the other elements will be stapled in the order listed above.

Grade

Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Light Bulb Energy Use \_\_\_\_\_\_\_/2 \_\_\_\_\_\_\_/2 \_\_\_\_\_\_\_/2

Carbon Footprint \_\_\_\_\_\_\_/2 \_\_\_\_\_\_\_/2 \_\_\_\_\_\_\_/2

Solar Energy Questions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/2

Checks \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/4

Paragraphs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/5

Presentation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/5

Participation \_\_\_\_\_\_\_/3 \_\_\_\_\_\_\_/3 \_\_\_\_\_\_\_/3

Bonus Points \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/0

Total Grade \_\_\_\_\_\_\_/23 \_\_\_\_\_\_\_/23 \_\_\_\_\_\_\_/23

Project Checklist and Timeline (must receive a check to move onto the next item – all items must be completed by Friday, December 6)

Pick up project sheet, write names, and watch introductory videos (Mon. Dec. 2) \_\_\_\_\_\_\_

Calculate your light bulb energy use and carbon footprint (Tue. Dec 3) \_\_\_\_\_\_\_

Read Solar Energy article and answer article questions (Tues. Dec. 3)\* \_\_\_\_\_\_\_

Research different forms of energy and choose one to focus on (Wed. Dec. 4)\* \_\_\_\_\_\_\_

Energy Focus: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Begin writing paragraphs and making presentation (Thur. Dec. 5)\*

Present to the class and turn in paragraphs (Fri. Dec. 6)

\*Recommended

Different Sources of Energy (write down quick notes for at least 3):

Coal

Petroleum

Natural Gas

Nuclear

Hydropower

Solar Energy

Wind Energy

Geothermal Energy

Biofuel

Video Links:

Video on Energy Conservation (viewed in class)

video.nationalgeographic.com/video/environment/energy-environment/energy-conservation/

Video on Alternative Energy (viewed in class)

http://video.nationalgeographic.com/video/environment/energy-environment/alternative-energy/

Video on Solar Power (viewed in class)

http://video.nationalgeographic.com/video/environment/energy-environment/solar-power/

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period: \_\_\_\_\_\_\_\_\_

***Light Bulb Energy Use***

Total number of light bulbs in your house: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Total Bulbs) x (kWatts of Electricity Used Per Bulb) x (Hours Used Each Day) x

(Avg. Cost per kWh) x (Days in a Year) = (Total Spent on Lights in 1 Year)

Reg. Incandescent: (\_\_\_\_\_\_\_\_ Bulbs) x (0.06 kWatts) x (\_\_\_\_\_\_ h) x ($0.15) x (365) = $\_\_\_\_\_\_\_\_\_\_\_\_

Energy Efficient: (\_\_\_\_\_\_\_\_ Bulbs) x (0.015 kWatts) x (\_\_\_\_\_\_ h) x ($0.15) x (365) = $\_\_\_\_\_\_\_\_\_\_\_\_

Bonus! Keep thinking…

You know you’re saving money on electricity, but what about on the light bulbs themselves? Assume a regular incandescent light bulb lasts for an average of 1,800 hours and costs and an average of $0.56 per bulb and an energy efficient bulb lasts for 10,000 hours and costs an average of $1.39 per bulb. Is it worth it for you to switch out all the light bulbs in your home? Explain your answer - must include calculations and a detailed explanation for bonus points. (Hint: How many regular bulbs might you go through each year? How many energy efficient bulbs?)

Using http://environment.nationalgeographic.com/environment/energy/great-energy-challenge/light-bulb-savings-calculator/

You have \_\_\_\_\_\_\_\_\_ (more/less) light bulbs than the average U.S. household.

You use \_\_\_\_\_\_\_\_\_ (more/less) efficient bulbs than the average.

You are likely spending about \_\_\_\_\_\_\_\_\_ (more/less) than the average U.S. household each year on lighting energy, due to your choice of light bulbs.

If every household in the U.S. took the same steps on lighting efficiency, it would (waste/save) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in energy costs and would be like (adding/shutting down) \_\_\_\_\_\_\_\_ coal power plants.

***Carbon Footprint***

Go to the website below, fill out the information it asks you for, and answer the questions below.

http://www.bp.com/en/global/corporate/sustainability/bp-energy-lab/calculator.html

Your energy usage is \_\_\_\_\_\_\_\_\_% (more/less) than people like you.

Total: \_\_\_\_\_\_\_\_\_\_kWh/yr

Your carbon emissions are \_\_\_\_\_\_\_\_\_% (more/less) than people like you.

Total: \_\_\_\_\_\_\_\_\_\_\_ tonnes Co2/yr

Questions: (you may work on these questions as a group, in class, on Tuesday, but each person needs to fill out the answers)

What is your Carbon Footprint?

What are Carbon Emissions?

Are Carbon Emissions good or bad for the environment? Why?

Solar Panel Article

1. What are some apparent pros and cons of solar panels and solar energy? Make sure to reference the videos and/or the article in your response.

2. What are the two things this new ceramic material can do?

3. What is the new ceramic material made of?

4. Why are these elements better than what solar panels are traditionally made of?

5. From what you read in the article and saw in the videos, is it important that scientists are working on developing new kinds of solar panels? Why or Why not?