

Nuclear & Renewable Energy



By:
Joshua Loukotka
Samantha Deering
Zakary LaButte

Nuclear Energy

- Created through Nuclear Fission
 - Splitting of Atoms
 - Causes Nuclear Reaction
- Creates Heat and Electricity
- Harmful to the Environment if not Properly Disposed of



Renewable Energy

- Comes from a Direct Source (wind, sun, water)
- Available in Several Different Places Around the World
- Cannot be Depleted; not Dependent on Resources
- Does not Harm the Environment

Similarities

Creates Energy

Job Opportunities

Differences

Environmental Impact:

- Renewable Energy= Safe
- Nuclear Energy= Harmful

Renewable is Cheaper

Nuclear Harvests more
Energy in a Shorter
Time

Project Overview

- Gain Knowledge of Nuclear and Renewable Energy
- Activities and Workshops that compare and contrast Nuclear and Renewable Energy
- Model Demonstrating a Renewable Energy Source
- Present Model, Along With Information

Entry Document

JZS Energy Company



Hello Students,

My company is in need of your help. Our company is losing money with all the nuclear energy we are using. We need your help finding a way to use a renewable energy source to create energy. You will have to do a couple things for us to show that you understand the basic knowledge of nuclear energy and renewable energy. You need to include the following in your presentation to us...

- *Describe peaceful technological applications of nuclear fission and radioactive decay.*
- *Describe possible problems caused by exposure to prolonged radioactive decay.*
- *Explain how stars, including our Sun, produce huge amounts of energy (e.g., visible, infrared, ultraviolet)*

you must create for us a graph comparing the pros and cons of nuclear energy, to renewable energy.

Lastly you must create a model of a renewable energy source for us. This model must not be the same as the one we have shown you. You can use any type of renewable energy.

Anticipated K/NTK

Knows	Need to Knows
<p>We need to describe peaceful technological applications of nuclear fission and radioactive decay.</p> <p>We have to Describe possible problems caused by exposure to prolonged radioactive decay.</p> <p>We have to Explain how stars, including our Sun, produce huge amounts of energy (e.g., visible, infrared, ultraviolet)</p> <p>We have to create a model of a renewable energy resource.</p> <p>Cant use the same one as in the lab.</p> <p>We must create a graph of nuclear energy and renewable energy.</p>	<p>Question/Answer</p> <p>When is it due?/Due in 11 days</p> <p>What is renewable energy resource?/Included in workshop.</p> <p>What is nuclear fission?/ Included in workshop.</p> <p>What is radioactive decay?/ Included in workshop.</p> <p>How are we presenting?/ Powerpoint</p>

Knows & NTK's

- Show Knowledge of Renewable and Nuclear Energy (include three benchmarks)
- Build a Simple Renewable Energy Source
- What are the Basics of Nuclear and Renewable Energy?
- What will our model be?
- Due Dates of Assignments

Activities

- Lab
- Worksheet/HW

Both Contain Answer Key*

Lab

SOLAR POWERED WATER HATER.

You will need to following supplies:

- Cardboard box at least 2ft x 1ft x 3 in.
- Black rubber hose
- Bucket (at least 2 gallons)
- A way to cover the bucket (for insulation purposes)
- Tin Foil
- Plastic rap
- Thermometer
- Duct tape
- Black Spray Paint

1st step

Take the cardboard and line it with tin foil. Note* Make sure the tin foil's shiny side is facing outwards.



2nd step

Snake the black hose around on top of the hose as in the picture below. Tape the hose to the tin foil side.



Lab

3rd Step

Spray paint the tin foil and the hose black. This will help attract more sun to the box.



4th step

Cover the box with plastic rap. This will create a green house effect inside the box and help to keep heat from escaping.



5th step

Fill the bucket with water. Take one end of the hose and place it in the bucket all the way at the bottom. The other end of hose you need to suck to create a vacuum. This will get the the water flowing through the hose.



Lab

(DAY 2)

6th step

Create a chart and record the temperature of the inside of the box, and the temperature of the water every 10 mins.

CRITICAL THINKING:

What made the water heat up?

The sun heats up the box to high temperature. As the water flows out of the bucket, through the box, and back into the bucket, the water will warm up.

Why is this a renewable energy source?

It uses the sun to heat the water, and requires no other energy besides solar, which is a renewable resource.

What were the results of your chart?

The box temperature would continuously increase, and the water temperature would gradually increase.

Worksheet

Name: _____ Date: _____ Hour: _____

Define:

Nuclear Fission -

Nuclear Energy -

Radioactive Decay -

Renewable Resources -

Non-renewable Resources -

- 1.) Describe how Nuclear Fission occurs:
- 2.) What are the advantages of renewable resources?
- 3.) What problems are caused by prolonged exposure to radioactive decay?

Energy Resource	Advantages	Disadvantages
Fossil Fuels (coal, petroleum, natural gas)		
Nuclear		
Hydropower		
Solar		
Wind		
Biomass		
Geothermal		



Name: _____ Date: _____ Hour: _____

Here is a helpful website: http://imagine.gsfc.nasa.gov/docs/science/knownow_11/em_spectrum.html

Define:

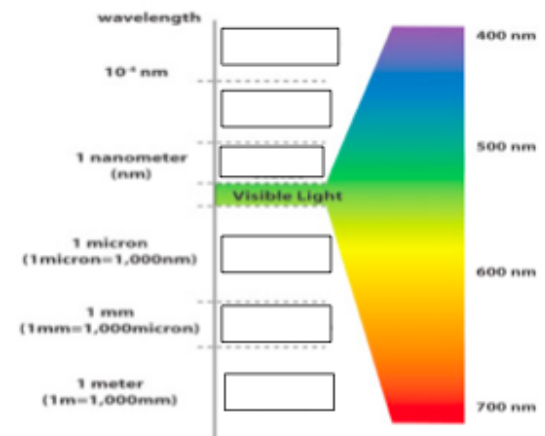
Visible light -

Infrared light -

Ultraviolet light -

- 4.) Compare the wavelengths of visible, infrared, and ultraviolet light.
- 5.) Which type of light do you think produces the most amount of energy in the least amount of time? Explain.
- 6.) How do stars, such as the sun, create large amounts of energy?

Label the light spectrum below:



Timeline

Day	Activity
1	Read Over Entry Document/ do knows need to knows.
2	Answer all need to knows.
3	Lab
4	Record Lab Results
5	Workshop
6	Give worksheet for HW. Work on in class, finish rest at home.
7	Group time
8	Group time
9	Practice Presentation
10	Presentation

Rubric

	Proficient	Advanced
Content	<p><i>Describe peaceful technological applications of nuclear fission and radioactive decay.</i></p> <p><i>Describe possible problems caused by exposure to prolonged radioactive decay.</i></p> <p><i>Explain how stars, including our Sun, produce huge amounts of energy (e.g., visible, infrared, ultraviolet</i></p> <ul style="list-style-type: none"> Shows understanding of nuclear energy and renewable energy Demonstrates a renewable energy source through a physical model Group compared and contrasted nuclear and renewable energy, and explain which one they feel is better to use. Develop an experiment sheet for your model. Create a list of steps on how to create your model. 	<p>Models intended purpose worked successfully.</p> <p>Group explains if their model is a plausible real life energy source</p> <p>Produce a simple video or slideshow of your model being built, and in action.</p>
Critical Thinking	<ul style="list-style-type: none"> Group explains why one energy source is better then the other including things such as... cost environmental impact resources needed space needed jobs provided energy produced time taken to produce Performed Lab correctly 	<ul style="list-style-type: none"> Group formatted video professionally.

Rubric

	Proficient	Advanced
Oral Communication	<ul style="list-style-type: none">• Some sort of presentation software was used• Fonts and themes were consistent throughout presentation.• Speaker is dressed in a 'business casual' manner.• Speaker faces the audience throughout the presentation.• Speaker uses appropriate hand gestures, physical posture and eye contact and purposeful movement during the presentation.• Little or no vocalized pauses, confident tone, appropriate pace.• Speaker is focused on one main idea.• Project leader acted as 'MC' of the presentation; they introduced the project, introduced each speaker, and concluded the event.• Speaker is dressed in 'professional attire.'• Speakers physical presence during the presentation displays the appearance of a business professional• No vocalized pauses• Speakers audio presence displays enthusiasm toward the project and a professional attitude.	<ul style="list-style-type: none">• Project leader acted as 'MC' of the presentation; they introduced the project, introduced each speaker, and concluded the event.• Speaker is dressed in 'professional attire.'• Speakers physical presence during the presentation displays the appearance of a business professional• No vocalized pauses• Speakers audio presence displays enthusiasm toward the project and a professional attitude.

Presentation

- Use any Type of Presentation Software
- Must Contain Material Gone Over in Rubric
- Dress for Success
- Show your Understanding of the two Energies to the Class

Final Product

Solar Water Heater			
	Box	Water	Outside
Start	104°	62°	67°
30m	98°	64°	65°
1h	130°	69°	66°
1h 30m	140°	70°	69°
2h	137°	71°	68°
2h 30m	135°	73°	68°
3h	137°	74°	67°

Enjoy the Video!